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MAJOR LEAGUE BASEBALL FANS' CLIMATE CHANGE ATTITUDES AND
WILLINGNESS TO ADAPT: CLIMATE VULNERABILITY VS. AMERICA'S
PASTIME

By

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B.A., University of North Carolina at Chapel Hill, 2015
M.A., University of Alabama, 2018

A Dissertation
Submitted to the Faculty of the
College of Education and Human Development
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy in Educational Leadership and Organizational Development

Department of Health and Sport Sciences
University of Louisville
Louisville, Kentucky

May 2021

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A Dissertation Approved on

April 23, 2021

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DEDICATION

This dissertation is dedicated to my parents,
Mr. Jeffery Murfree and Mrs. Lisa L. Murfree, and to my grandfather, Dr. Dorsey E.
Murfree.

This dissertation is also dedicated in memory of my great-uncle Mr. Iley W. Murfree, and
my aunt Mrs. Marcella M. Murfree.

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It would take a dissertation's length to properly and adequately thank each person who has supported me through the completion of my doctoral journey. To every friend, mentor, family member, and stranger who I cannot individually name here, please know the depth of my gratitude and sincere appreciation. Thank you so much.

I would first like to thank the dedicated members of my dissertation committee. To my committee chair, Dr. Chris Greenwell, and committee members Dr. Marion Hambrick, Dr. Megan Shreffler, Dr. Mary Brydon-Miller, and Dr. Brian McCullough, I am immensely appreciative of your feedback, guidance, and support through my dissertation process. Additionally, thank you to the Sport Administration faculty, administrators, and current and former doctoral students at the University of Louisville, who have become like family to me. A special note of gratitude to Dr. Chelsea Police, who has been my rock since we began our doctoral journey.

I would also like to thank the students who I have had the pleasure of teaching and mentoring in the Sport Administration program at the University of Louisville. Their hunger for knowledge, quick wit, and critical thinking inspires and encourages me. Many thanks to my professional network in the Sport Ecology Group and my writing accountability group through the North American Society for Sport Management, both instrumental to my successes.

Most importantly, thank you to my family who have empowered me to chase and secure every dream. To my mother, Lisa, and father, Jeff, thank you for letting me be

courageous and cautious, silly and efficient, critical and kind, and curious and confident.

This dissertation is for you. Your unconditional love no matter where I roam fills the space between us, and I cannot wait to keep making you proud.

Last, but certainly not least, I would be remiss if I did not extend an honorable mention to my dog, Clyde. Rescuing Clyde on a whim in 2015 was the best decision I have ever made. He has been my physical and emotional support throughout multiple degrees, moves, and stages of life. He was with me for every page of this dissertation, and with him, I know I can tackle anything.

ABSTRACT

MAJOR LEAGUE BASEBALL FANS' CLIMATE CHANGE ATTITUDES AND
WILLINGNESS TO ADAPT: CLIMATE VULNERABILITY VS. AMERICA'S
PASTIME

Jessica R. Murfree

April 23, 2021

Climate change threatens the ability to enjoy sport around the world, including in the United States. While the scientific community reached consensus regarding the presence and severity of climate change near the turn of the twenty-first century, that same agreement has not been met across the American general public. Major League Baseball (MLB) is particularly vulnerable to climate change in the U.S. due to its season duration, geographic footprint, and largely outdoor nature. Therefore, the purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. Specifically, this study sought to advance climate change perception research by focusing on sport fans in a sport context, groups that are understudied in climate change and sport ecology research.

Using social identity theory to frame the significance of sport identification, this study aimed to model transitions from cognition to action for MLB fans. Social identity

theory served to explain how an individual creates meaning about the world around them, in this instance climate change, by the social groups to which they voluntarily belong, that is sport identification.

A cross-sectional survey design was used to address the study's purpose. The questionnaire was designed and hosted on Qualtrics Survey Software, but distributed as a Human Intelligence Task on Amazon's Mechanical Turk. The questionnaire contained items to measure fans' attitudes, general risk perceptions, sport-specific risk perceptions, and willingness to adapt. Participant responses ($n = 540$) indicated personal experiences with extreme weather most strongly influenced general climate change risk perceptions. Further, responses revealed fans who had general climate change risk perceptions were more likely to have sport-specific risk perceptions. This relationship was not moderated by sport identification, but sport identification did significantly predict sport-specific risk perceptions. Likewise, sport identification did not moderate the relationship between fans' sport-specific climate change risk perceptions and their willingness to adapt. However, responses revealed fans who perceived climate change risks to the sport were more willing to adapt their behaviors to climate change.

As a result of these findings, there were several theoretical and practical implications. Theoretically, although sport identification did not moderate the hypothesized relationships, social identity theory does serve as an avenue to explore the connections between sport fans and the realities of climate change on sport. The overall model structure was supported, indicating the possibility to examine found relationships through additional theoretical lenses. The findings revealed a direct connection between

sport consumer behavior research and climate change, opening new avenues for researchers within sport management and climate research.

From a practical standpoint, this study found early empirical evidence to support the United Nations' suggestion that sport fans are critical to engaging in, and accelerating, climate action in the sport sector. Additionally, this study's findings suggest pro-environmental efforts pertaining to climate adaptation in MLB should include fans, and the UN should invest in educational awareness regarding climate change risks to sport for fans.

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CHAPTER I

INTRODUCTION

Incremental and seemingly subtle changes in climate have altered the everyday lives of humans around the world (Semenza et al., 2011; Zanoocco et al., 2019). Climate change effects are more visible in developing and lower socioeconomic countries. Climate change effects lead to overall poor health outcomes and economic strife, and these threats are felt in the United States despite its resources and wealth (Karl et al., 2009). This is largely due to incremental changes over time intensifying and compounding additional climatic events like hurricanes, droughts, and wildfires (Murfree & Moorman, 2021). The cumulation of these subtle changes poses a significant threat to the survival of sport even within the United States (Dingle & Stewart, 2018; Orr & Inoue, 2019). For example, Hurricane Irma's severity and duration canceled or postponed approximately two-dozen NCAA Division I football games in 2017 (Murfree & Moorman, 2021). The 2020 wildfires burned hundreds of millions of acres along the west coast of the United States and compromised nationwide air quality which resulted in the postponement of Major League Baseball (MLB) games, National Football League (NFL) practices, and thoroughbred horse racing events (Associated Press, 2020; ESPN News Services, 2020; Wagoner, 2020). Additionally, the west coast droughts across the same region amplify the severity of wildfires and contribute to the lack of adequate snow cover

for winter sports (Bürki et al., 2003). Droughts further intensify extreme heat that impedes outdoor sports nationwide (Kakamu et al., 2017). For athletes and spectators alike, climate change can make sport impossible to play (Bürki et al., 2003), host (Scott et al., 2015), and watch (Kay & Vamplew, 2006).

The United Nations Climate Change Secretariat suggests sport can be leveraged for climate action because of its visibility and social influence (United Nations, 2018). Sport, unlike other business sectors, has widespread potential to influence diverse populations to engage in climate action (Inoue & Kent, 2012). Through the Sports for Climate Action Framework, the United Nations (2018) encourages sport organizations to use their platforms to mobilize sport businesses, participants, and consumers to serve as environmental stewards. Specifically, the Sports for Climate Action Framework asserts:

Sports' global interest for billions of fans, and the media coverage generated in response, provide a strong platform for the sport sector to play an exemplary role in meeting the challenge of climate change, and inspire and engage large audiences to do the same. (United Nations, 2018, p. 3)

Therefore, the present study investigates how sport, namely Major League Baseball, can be leveraged for climate action.

Major League Baseball

The late cultural historian and American Presidential Medal of Freedom recipient, Jacques Barzun, remarked “whoever wants to know the heart and mind of America had better learn baseball, the rules and realities of the game” (Roberts, 1982, p. 145). This 1950s quote, engraved at the Baseball Hall of Fame in Cooperstown, New York, maintains the cultural significance of baseball in the United States, embodying a

manufactured motif of the “American Dream” like Ford Motors and rock and roll music (Roberts, 1982).

The MLB is the U.S.’s oldest major sport league and is a symbol of American culture, with a diverse geographic footprint, earning the spot as America’s favorite pastime (National Archives, 2020; Voigt, 1974). American professional baseball has long played a central role in how Americans, and sport fans, culturally orient themselves and their communities. Popular culture scholar, George Grella (1976) remarked, “in its theory and practice baseball embodies some of the central preoccupations of that cultural fantasy we like to think of as the American Dream. Anyone who does not understand the game cannot hope to understand the country” (p. 550). The present study aimed to better understand the country by understanding MLB fans, particularly their attitudes and perceptions of risk toward climate change: an issue threatening baseball’s franchise value, survivability, and status as America’s favorite pastime.

With 30 teams each competing in 162 games in the regular season lasting from March to October, a broad geographic footprint spanning 17 states, Washington D.C., and Canada, and few climate-controlled stadiums protecting active and non-active participants from climatic events, MLB has a greater exposure and vulnerability to environmental harm than other major sport leagues (Major League Baseball Players Association, 2017). During the 2018 MLB season, the National Wildlife Federation penned a fact sheet on the relationship between the MLB and climate change following a spike in early-season extreme weather, noting by the end of April that year, “there [had] already been a record-breaking amount of ‘weather-related postponements.’ Many MLB teams are vulnerable to weather, since only 7 of the 30 MLB stadiums have retractable

roofs” (Skeens, 2018, p. 1). These rainouts, delays, and postponements often force doubleheaders or late first pitches, affecting athletes’ physical and mental health, and the economic costs associated with such delays (Murfree & Moorman, 2021). For example, Erickson et al. (2016), in seeking to draw correlations, rather than causations, between risk factors and injuries, noted recent years have seen increases in both upper and lower extremity injuries among MLB players and that the majority of injuries are sustained in April, the same month the weather-related postponements record was broken in 2018.

After the 2018 MLB season saw a total of 54 weather-related postponements, the number of roofed MLB stadiums grew to eight stadiums in 2019, as Globe Life Field was built with a retractable roof for the Texas Rangers (Kellison & Orr, in press). Although limited, climate-controlled MLB parks assure spectator comfort, athlete safety, and game completion, given baseball’s susceptibility to climate change. Of the 22 remaining open-air MLB stadiums, 12 are located in major cities identified by The Weather Channel’s Climate Disruption Index’s top-25 U.S. cities facing climate change impacts (Berger, 2015). Additionally, because MLB teams are geographically dispersed across the country, teams face various climate hazards (Orr, 2020) and the vulnerabilities of stadiums vary by location (Kellison & Orr, in press; Orr, 2020). These impacts and potential threats are not lost on the MLB, a leader in sport environmental sustainability as a league (Footer, 2020; Trendafilova et al., 2013) and by individual clubs (Ciletti et al., 2010; MLB, 2019b). To be a climate leader, though, the MLB should engage fans to leverage baseball’s influence and encourage climate action consistent with the UN’s Sport for Climate Action Framework.

These efforts could be troublesome given the demographic makeup of MLB fans correlates with the demographic makeup least likely to support climate action in the U.S., the very issue that underpins environmental sustainability (Pew Research Center, 2015). The composition of MLB fans is mostly white and male, and has an average age of 57 years, the oldest of all major U.S. professional leagues (Carter, 2019). The prevalence of white male fans is consistent with the makeup of MLB athletes, general managers, team ownership and senior administration, and collegiate athletes funneling into the majors (Lapchick, 2017). A 2020 survey by Morning Consult found 60% of MLB team fans were white, behind the National Hockey League (NHL) by just one percent (Silverman, 2020). Simultaneously, compared to people of color, non-Hispanic white Americans have historically been the least concerned about climate change and the least likely racial demographic to engage in climate action or support climate action through voting tendencies (Ballew et al., 2020). A 2018 national survey on political identities found White men significantly more aligned with the Republican Party than any other combination of gender and ethnicity (Pew Research Center, 2018). Americans who identify as Republican, or as politically conservative are also less likely to believe in and support climate change in comparison to their Democratic or politically liberal counterparts (Kamarck, 2019; Pew Research Center, 2015). The Morning Consult survey also found that teams across the U.S. major leagues with fans who most likely lean Republican were concentrated in the MLB (Silverman, 2020).

It is particularly valuable for MLB to understand its fan base's climate change attitudes and perceptions of risk. As a key stakeholder group, fans could withhold support for climate-related advancements and adaptations at the league level. To date, there is no

known empirical evidence of fans' understanding and attitudes toward climate change, nor known evidence of fan support for the MLB's pro-environmental initiatives. Sport leagues and teams rely on fan support, and MLB fans are a critical stakeholder group within baseball, American, and professional sport contexts. MLB fandom and climate change skepticism are directly competing perspectives within American culture, given the MLB's vulnerability to the effects of climate change. This research focusing on climate change attitudes and risk perceptions of MLB fans in the U.S. addresses the stark juxtaposition of a sport that is inherently American with a scientific, yet political, topic that is vigorously debated outside the scientific community.

Statement of the Problem

Major League Baseball is vulnerable to climate change, jeopardizing its ability to remain America's favorite pastime. However, despite climate change's impacts on everyday lives, and its visible effects on baseball, variations in attitudes and risk perceptions of climate change exist across the general public (Lee et al., 2015). Exploratory research on sport fans' climate change dispositions can further inform sport organizations on ways to engage them in sustainable and pro-environmental efforts. Findings providing insight into fans' willingness to support climate adaptation strategies or alternatives in their own lives (e.g., paying more for fossil fuels and electricity, choosing to walk and bike more frequently) serve as a foundation for future research on fans' willingness to support organizational climate adaptation strategies (e.g., flexible first-pitch times to avoid inclement weather and fixed-roofed stadiums).

The lack of scholarly inquiry on sport fans' climate change attitudes is a prominent gap in research given the UN's Sport for Climate Action Framework (2018),

which recognized sport can serve as a vehicle for engagement with climate change for spectators. The ease at which climate change threatens the ability to enjoy sports is ignored, further substantiates the need for empirical research on sport and attitudes toward climate change (Dingle, 2016). Although sport organizations engage in environmentally sustainable and pro-environmental behaviors to help curb their adverse effects on the changing climate, fans' perceptions of climate change and climate adaptations in sport have rarely been studied. This lack of study is concerning, as sport fans represent a critical stakeholder group in the sport landscape and constitute a major contributor to spectator sport's environmental impact (Dolf & Teehan, 2015). The UN has identified fans as critical to enhancing and accelerating climate action worldwide through the UN's Sport for Climate Action Framework. Signatories of the framework include sport organizations like the New York Yankees and New York Mets, who have committed to achieving the goals of the Paris Climate Agreement (UNFCCC, 2021). The Paris Climate Agreement, entered into under the United Nations Framework Convention on Climate Change (UNFCCC), is the first international treaty committed to reducing global temperatures, carbon emissions, and the effects of climate change around the world.

However, the U.S. has demonstrated national uncertainty regarding climate policy by splintering efforts for long-standing change. Namely, in 2019, the Trump administration officially withdrew the United States from the Paris Climate Agreement, becoming the first and only state party to do so (Hersher, 2020; UNFCCC, n.d.). Then, in January of 2021, President Biden re-entered the U.S. into the Paris Climate Agreement, illustrating the country's lack of executive consensus on climate change in under two

years (Davenport & Friedman, 2021). This stalemate is further exemplified in baseball. While baseball is quintessentially American, climate change support is traditionally not (Leiserowitz, 2005).

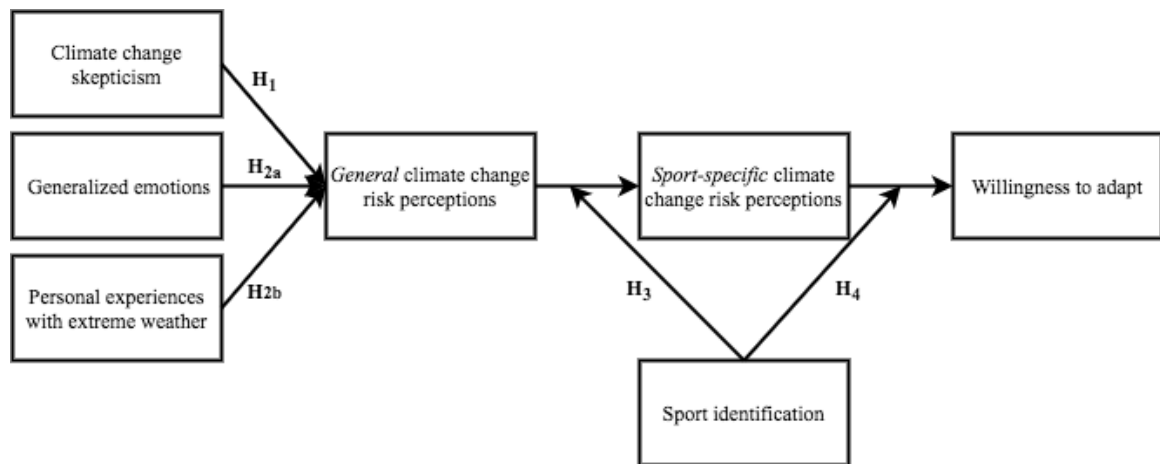
Study Purpose and Hypotheses

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. The present study suggests, for fans, sport can disseminate the realities of climate change (climate vulnerability) and encourage positive action (climate adaptation). However, not all fans are attached to their favorite sport in the same way (Robinson & Trail, 2005). For this reason, the present study posits differences in sport identification may lead to differences in sport-related climate change risk perceptions and fans' willingness to adapt to climate change. The current investigation suggests the unifying nature of sport fandom, and a collective group identity surrounding the support of a particular sport or team, may neutralize the segmentation caused by the aforementioned divides. It also implies something enjoyable and integral to society, sport, can be used to educate and reduce the psychological distance between Americans and the threat of climate change harm (Spence et al., 2011). The stratification between differently identified fans' risk perceptions and willingness to adapt have managerial implications for sport organizations seeking to engage their fans in environmental sustainability and implement climate mitigation strategies. This study's findings also have theoretical implications for sport and socio-environmental scholars alike. These findings helped bridge gaps between sport ecology and consumer behavior research in sport management studies as it pertains to modern society's most pressing

issue (i.e., climate change). In social and environmental studies, these findings situate social identity theory within other environmental identity theories (e.g., Azjen, 1991; Dunlap et al., 2000; Stern et al., 1999) to understand how people are influenced by their social groups (e.g., sport fandom), and how their social group affects their environmental perceptions and behaviors. The relationships of interest are presented below in Figure 1, and will be described in the subsequent sections.

Figure 1

Conceptual and Theoretical Model



Climate Change Attitudes and Risk Perceptions

Despite the consensus within the scientific community on the presence and causation of climate change (Bertoldo et al., 2019; IPCC, 2018), a widespread understanding of what this means does not exist across the general public (Carrus et al., 2018; Weber & Stern, 2011). Like other controversial scientific establishments (e.g., vaccine safety, evolution), there are social factors which shape a person's attitudes toward climate change (Dagher & BouJaoude, 1997; Kennedy et al., 2005). Two of the most prominent social and ideological influencers of climate change attitudes and risk

perceptions are religious beliefs and political orientation (Dunlap et al., 2016; Jenkins et al., 2018). Researchers have historically indicated deeply-rooted attitudinal foundations can subdue scientific evidence (Lave & Dowlatabadi, 1993). A person's understanding and perceptions of climate change are shaped by their immediate frames of reference.

A person's climate change attitudes also inform their risk perceptions. O'Connor et al. (1999) suggest that environmental information and knowledge inform risk perceptions, comparable to how information is framed to inform environmental beliefs. Like the political and ideological divides on climate change, risk perceptions face influence from the same polarizations. Leiserowitz (2005) writes, "public risk perceptions can fundamentally compel or constrain political, economic, and social action to address particular risks" (p. 45). This further entangles a person's socioeconomic, political, and personal attributes with their support, or lack thereof, for a scientific phenomenon. Because these traits are both demographic and ideological, climate change attitudes and risk perceptions can reflect a population's diversity.

Like the climate itself, climate change perceptions are not stagnant. Sunstein et al. (2017) found that belief in anthropogenic, or human-originated, causation influences the way people perceive new, competing evidence about the existence and severity of climate change. Their findings revealed individuals who believe in climate change's human-made origins were more likely to alter their beliefs in response to bad news (i.e., more drastic increases in global temperatures) than those who were skeptical about anthropogenic causation. Further, their findings suggest that because bad news reinforces climate change beliefs among those already concerned, polarization is predictable and asymmetrical. Sunstein et al. (2017) note, "[this] asymmetry undoubtedly contributes to

polarization concerning climate change, as both alarming and less alarming news comes to people's attention" (p. 1442).

Climate change risk perceptions are positively associated with levels of concern (Sundblad et al., 2007). Conversely, skepticism about the existence of or causes of climate change minimizes the perceived threat from climate change. The present study hypothesizes that increased climate change skepticism leads to decreased risk perceptions. Climate change skepticism is regarded as a significant attitudinal factor from which risk perceptions can be gauged (Leiserowitz, 2005). Because the conditions for belief polarizations exist, it is critical to scrutinize how a person's ideological influencers can shape potentially contradicting convictions.

The widespread nature of climate change media content and dissonance of opinion have resulted in differing beliefs and a considerable amount of skepticism regarding the presence and severity of climate change among the general public (Egan & Mullin, 2017). Mian and Khan (2020) noted the divide between scientific consensus and public opinion of climate change widens as political contention and the spread of misinformation persist. There are a number of reasons for the prevalence of skepticism regarding the risk of climate change impacts. More specifically, differing perceptions, uncertainties, and beliefs lead to skepticism. These components are, like beliefs, influenced by a person's ideological influencers. Specifically, climate studies indicate those who are more skeptical of climate change are more dismissive of its potential risks (Haltinner & Sarathchandra, 2018; Hoffman, 2011; Kahan et al., 2011). Because skepticism contradicts belief, and also influences a person's risk perceptions, this study's first hypothesis is as follows:

H₁- Climate change skepticism will negatively influence MLB fans' general climate change risk perceptions.

Existing research indicates Americans' concerns are influenced by issues that seemingly pose more pressing societal risks, such as terrorism and economic crises (Weber, 2016). Whitmarsh (2011) suggests climate change skepticism and perceptions of risk result from a lack of personal experience with climate change hazards, public perceptions of climate change as a low priority issue, and conflicting information sources on such a complicated subject matter. These uncertainties are enhanced by the popular discourse on climate change, which are inundated with rhetoric and semantics and fueled by hyperbolic language and political claims through the media (American Psychological Association, 2009; Corbett, 2019; Hoffman, 2015).

Deeply-rooted, historical political divides influence religious and educational ideologies (Antonio & Brulle, 2011; Ecklund et al., 2017; Morrison et al., 2015), and as a result, climate change in the U.S. has long been a controversial subject matter (Hoffman, 2011). Corner et al. (2012) considered ways in which climate change perceptions could be altered in politically polarizing ways by comparing climate change attitudes with both scientific information and political/moral information, finding the factors leading to a person's orientation toward climate change are deeply personal and intertwined. Stevenson et al. (2014) identified efforts to increase climate science literacy enhanced polarizing divides on the subject. Their findings revealed, among adults, climate change risk perceptions were influenced by worldviews, rather than scientific knowledge (Stevenson et al., 2014). This finding is relevant because it reveals knowledge-based literacy efforts to communicate climate risks may prove ineffective for those who are

already skeptical of climate change. Further, prior research has indicated self-reporting knowledge about climate change yields inconsistent results (Brody et al., 2008; Kellstedt et al., 2008; Menny et al., 2011), and does not distinguish subjective understanding from factual science (Reser et al., 2012; van der Linden, 2015). Regarding worldviews, researchers have discussed the individualist nature of climate change risk perceptions as a result of predisposed values (Kahan et al., 2011; Stevenson et al., 2014).

Contributing to a person's individualized worldviews are their cognitions (e.g., skepticism) and their experiential processing. Experiential processing refers to the way human beings process and evaluate information gained through lived experiences in sensory (emotion) and bodily (experience) ways (Gadeikis et al., 2017). Like van der Linden (2015), experiential processing in the present study contains two dimensions: generalized emotion (sensory) and personal experiences with extreme weather events (bodily). In the present study, generalized emotion refers to a holistic "positive (like) or negative (dislike) evaluative feeling" toward climate change (p. 115). Processing information emotionally has shown to affect judgement and risk perceptions of climate change (Leiserowitz, 2006; Smith & Leiserowitz, 2012). Personal experiences in prior research has shown to influence climate change skepticism (Haltinner & Sarathchandra, 2018) and risk perceptions (Reser et al., 2012; Spence et al., 2011) as the negative consequences of climate change become more tangible in a person's life. In other words, first-hand experiences of climate hazards (e.g., extreme weather events) reduce the psychological distance between oneself and the realities of climate change (Spence et al., 2011). It is for these reasons experiential processing is also considered a significant

predictor of climate change risk perceptions. Therefore, the second set of hypotheses is as follows:

H₂- Increased climate change experiential processing will positively influence MLB fans' general climate change risk perceptions.

H_{2a} – Generalized emotions will positively influence MLB fans' general climate change risk perceptions.

H_{2b} – Personal experience will positively influence MLB fans' general climate change risk perceptions.

General Climate Change Risk Perceptions and Sport-Specific Risk Perceptions

Highly developed countries, such as the U.S., are not the most vulnerable to detrimental climate effects and can seemingly afford to defer confronting it (Zanocco et al., 2019). In conjunction with climate-related attention, climate change support in the U.S. resurfaces in the wake of natural disasters and extreme weather events, like recent hurricanes and wildfires, which have become more frequent and severe (Burton et al., 2006; Dellinger, 2016). While growing environmental understanding and climate action exist at the industrial and organizational levels, an individual's stance on climate change, and how they perceive its risks, can stem from the various socio-cultural groups to which they belong. These positionings and uncertainties on the probabilistic, and statistically proven, issue of climate change can develop polarizing rifts between social groups. One way to potentially combat this, and generate more tangible understanding, is by demonstrating climate change's effects on things people care about, like sports. In an effort to better understand differences in individuals' climate change attitudes and risk

perceptions, the present study considers the role of sport fandom on a person's sport-specific climate change risk perceptions.

Because climate change attitudes, support, and action are influenced by risk perception which stem from the actualization of threat or harm, the present study sought to determine if sport-specific climate change threats shape sport fans' willingness to adapt. In fact, climate studies are emerging in sport as evidence of climate change's effects on sport and sport's ability to enact pro-environmental change (Inoue & Kent, 2012; Orr, 2020; Rixen et al., 2011). This is due, in large part, to the accelerating challenges climate change poses to the sport sector (Orr & Inoue, 2019). The sport industry provides a realm through which the effects of climate change are particularly tangible, despite the industrialization or development of a given country or region. Because of the tangible realities of climate change on sport, sport identification may also serve as a vehicle for shaping climate change attitudes.

Sport Fandom as a Socio-Cultural Group

Sport identification refers to the amount of attachment and preference a person has toward a particular sport (Wann & Branscombe, 1993). Theoretically, sport identification is relevant when discussing team identification, sport fandom, and consumer behaviors. Team identification determines the degree to which a fan feels connected to a favorite team, while sport identification more broadly associates sport fans with their favorite sport (Greenwood et al., 2006). The degree to which a fan identifies with a sport influences not only their consumer behaviors, but their attitudes and thoughts (Hong & Rhee, 2016). Therefore, the present study suggests fans who are more highly identified with a sport will have increased sport-specific climate change risk perceptions

due to their attachment to a sport. In certain ways, sport and team identification blur in-group bounds established by other social ideologies like religion and political affiliation (Huddy, 2001; Wann & Grieve, 2005). This may help sport create meaning for people on the issue of climate change, create a sense of belonging as it pertains to the inability to enjoy sport due to climate change, and explain how team identification can encourage climate change risk perceptions in light of sport's climate vulnerability. Highly identified fans will feel more concerned about climate hazards making their favorite sport vulnerable to climate change, jeopardizing their ability to enjoy that sport. Therefore, the third hypothesis is:

H₃- Sport identification will moderate the relationship between fans' general climate change risk perceptions and their sport-specific climate change risk perceptions.

Sport-Specific Risk Perceptions and Willingness to Adapt

The sport industry has begun acknowledging its detrimental contributions to the state of the environment, and sport teams and leagues are attempting to address their own environmental impacts. These efforts for sustainability have materialized in initial responses to harmful environmental behaviors through recycling and reducing waste, pro-environmental promotions and messaging, increased energy efficiency, and movement toward renewable products and sustainable practices (Casper et al., 2012; Mallen et al., 2010; McCullough et al., 2016).

While these are examples of environmental adaptation, they primarily occur at the organizational level without regard to sport fans' orientations toward climate change and its risks. Additionally, several sport scholars have suggested and demonstrated sport can

be leveraged to encourage pro-environmental behavior among fans (Casper et al., 2014; Gemba Group, 2019; Inoue & Kent, 2012; Trail & McCullough, 2018; 2020). These studies have focused on consumer and organizational behavioral changes in light of environmental issues. While the social nature of behavioral changes in sport, like recycling and composting, are beneficial, these studies do not consider how fans' sport consumption is threatened by climate change. The present study suggests the social dynamic of sport, like other ideological influencers, provides an opportunity to corroborate, communicate, and confront the realities of climate change, especially as they relate to a person's understanding of the issue of climate change and its impact on sport.

To date, notable sport ecology research has illustrated how sport fans are receptive of pro-environmental mediation strategies. For example, Inoue and Kent (2012) illustrated how sport is an effective messenger of environmental protection, also demonstrating fans' receptivity. Further, Casper et al. (2017) found sport can influence fans' pro-environmental behavior at sporting events and in their everyday lives. Likewise, Trail and McCullough (2020) furthered this pathway by finding segmentation in fans' receptivity, and ultimately noted sport can be used to promote environmental advocacy and lasting behavioral change. While existing research establishes connections between sport fans and sustainable mediation strategies, the present study extends aspects of consumer behavior beyond environmental sustainability to specifically tackle climate change. This avenue is a novel advancement of the previous literature because it sought to understand if climate change attitudes and risk perceptions are influenced by sport fandom, the sociological variables that underscore sustainable engagement in sport.

A person's climate change attitudes inform their risk perceptions, which inform their willingness to adapt (O'Connor et al., 1999). Each of these components is shaped by the sociological inroads that help people understand their experiences with climate change and what their contributions could be. On climate adaptation, Kellstedt et al. (2008) acknowledge an association exists between personal attributes and climate change risk perceptions, noting "attitudes, values, and beliefs are also strongly associated with identification of risks and support for corrective action" (p. 115). Assessing adaptation in a sport context asks how willing a sport fan might be to do something about their perceptions of a given climate change risk or vulnerability. For instance, MLB fans could demonstrate their willingness to adapt to climate change by supporting a team's replacement of an open-air stadium to an enclosed facility, be willing to pay more for tickets if a portion of the price is used to offset climate impacts, or by remaining a fan if a given team decides to relocate due to climate vulnerability (Hendee & Burdge, 1974; Linnenluecke et al., 2013; Orr, 2020; Orr & Schneider, 2018). The precursor to organizational adaptation is willingness to adapt personally. Personal adaptation strategies include willingness to pay more for fuel, electricity, and other consumer goods, and willingness to travel by car and plane less frequently (Xie et al., 2019).

The current investigation suggests the propensity to support these strategies is related to an individual's relationship with the sport. Specifically, while an individual may have lower climate change risk perceptions as they relate to their everyday lives, their risk perceptions may change as a result of being a highly identified fan in light of the climate change risks faced by the sport. It is for these reasons the present study suggests sport identification would moderate the relationship between sport-specific

climate change risk perceptions and willingness to adapt. This is supported by Hong and Rhee (2016), who posit sport identification is a key variable for sport consumer behaviorists because highly identified fans experience increases in their willingness to support, purchase intentions, and overall involvement with the sport and organization. The present study sought to determine if this willingness, due to differences in fan identification, applies to MLB fans' personal lives. Therefore, the fourth, and final, hypothesis is:

H4- Sport identification will moderate the relationship between fans' sport-specific climate change risk perceptions and their willingness to adapt to climate change.

Study Significance

This study aimed to serve both sport management theory and practice by providing evidence of sport fans' attitudes and risk perceptions of climate change as well as determining if those orientations are moderated by their sport fandom. A growing body of sport ecology research has addressed the relationship between sport and the natural environment as well as organizational-level environmental sustainability in response. However, the present study's goal was to incorporate individual sport fans into this dynamic, and uncover precursors that may impede or enhance their receptiveness and support for the sport industry's pro-environmental endeavors: by means of their climate change attitudes and perceptions of climate change risks on sport. Despite the sport industry's efforts to mitigate its environmental impacts, drastic changes in climate leave sport vulnerable. The presence and severity of climate change, although statistically proven, is a contentious and highly debated topic.

With sport in jeopardy, this study addressed a considerable gap in research by determining the moderating role of sport identification for an individual's climate change attitudes and risk perceptions. This study's results investigate cognitive filters (i.e., attitudes and risk perceptions) and social attributes (i.e., sport identification) of MLB fans toward climate change, thereby providing directions to aid sport managers in their development of ES initiatives and climate adaptation strategies. Additionally, findings from this study provide context and evidence to support the UN's Sport for Climate Action Framework's assertion that sport, at the consumer level, can be leveraged to support climate and pro-environmental action.

Delimitations and Limitations

There are several delimitations and limitations to acknowledge in this study. Delimitations and limitations are study conditions that affect the external and internal validities, respectively. While delimitations are study boundaries established by the researcher, and limitations are uncontrollable influencers, they both affect study results (Simon & Goes, 2013). The present study's delimitations and limitations are discussed in the following two sections.

Delimitations

This study's scope included U.S.-based fans of MLB teams, and data were collected based on fandom of teams in U.S. cities. Participants were asked to identify with which MLB team they associate their fandom. Findings are not generalizable to all 30 MLB teams, nor other professional sport teams in similar geographic settings. Therefore, this study did not intend to illustrate fandom moderation effects between climate change attitudes, risk perceptions, and willingness to adapt for intercollegiate,

international, or Olympic sports. The landscape of the MLB, thus its population of fans, includes one team located outside the U.S., the Toronto Blue Jays. MLB fans residing outside the U.S., despite the Blue Jays' location, were excluded from study parameters due to the focus on U.S.-based fans and climate vulnerability in the U.S.

Limitations

The aforementioned delimitations focus on restricting the scope of the present study. This study's limitations, however, are based on research design. First, the study's timing presents a limitation. Although the MLB season spans a considerable portion of the calendar year, data collection for the present study occurred during the off-season. This timing may affect sport fans' adequate recall of their sport identification. Also timing-related, the duration of the novel coronavirus pandemic and stints of inclement weather may impede potential respondents from participating or, likewise, affect fans' adequate recall of their sport identification. Regarding data collection, the present study is limited to voluntary participation, which may challenge the researcher's ability to gain a sample representative of U.S.-based MLB fans. The data were collected via Amazon's Mechanical Turk (MTurk), a web-based platform for crowdsourcing survey participants; however, it would be preferable to reach MLB fans directly through the organization. This approach would not be feasible given the need to collect data from differently identified fans.

Finally, because of the present study's novelty and interdisciplinary approach, there is not an extensive body of literature to directly support the stated hypotheses. Limitations exist regarding the scope of the literature review, as well as methodological approaches suitable for studying sport and climate change. The exploratory nature of the

present study poses a considerable opportunity to discover new limitations as well as potential gaps in existing research.

Definitions of Terms

Anthropogenic: Resulting from, or related to, changes in climatic conditions due to human activity and behavior (Rosenzweig et al. 2008).

Climate Adaptation: “The process of making internal adjustments to accommodate environmental changes and variations” (McCullough et al., 2020, p. 511).

Climate Change: The holistic alterations of climate manifestations for a region over an extended period of time demonstrated by fluctuations in temperature, amount of precipitation, wind patterns, and extreme weather events (Lindsey & Dahlman, 2020; Walsh et al., 2014).

Climate Change Beliefs: Attitudinal support or agreement for climate change’s existence, causes, severity, and consequences (Weber & Stern 2011).

Climate Hazard: A category of climate change risk uncontrollable by sport managers, characterized by “geographic location, intensity, and probability of negative occurrence” for events like natural disasters, extreme heat, and rising sea levels (Orr, 2020, p. 2).

Climate Change Risk: Category of factors caused by exposure to climate change including climate hazards and vulnerabilities (Orr, 2020).

Climate Change Risk Perceptions: “The perceived likelihood of negative consequences to oneself and society” from climate change (O’Connor et al., 1999, p. 462).

Climate Change Skepticism: Attitudinal doubt or denial of climate change’s existence, causes, severity, and consequences (Egan & Mullin, 2017).

Climate Vulnerability: A category of climate change risk defined by “the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes” (Stocker et al., 2001, p. 388).

Environmental Sustainability (ES): The practical response to climate change and the observance of practices to balance the needs of human society today while not compromising future societal needs, nor environmental ecosystems, natural resources, and biodiversity (Morelli, 2011).

Experiential Processing: “Direct awareness of sensory and bodily experience” (Gadeikis et al., 2017, p. 68).

Generalized emotion: Affective response whether “positive (like) or negative (dislike) ...towards an external stimuli” (van der Linden, 2015, p. 115)

Major League Baseball (MLB): The U.S.’s oldest major sport league comprised of 30 teams who compete at the highest level of professional baseball in the world (Klein, 2013; Voigt, 1974).

Pro-Environmental: Activities, behaviors, communications, or intentions that promote awareness of environmental responsibility, sustainability, or protection (Inoue & Kent, 2012).

Social Identity Theory: A socio-psychological approach to understand self-conceptualization and self-meaning through individuals’ social group belongings and behaviors (Tajfel & Turner, 1986).

Sport Ecology: “The study of sport, the natural environment, and the bidirectional relationship between the two” (McCullough et al., 2020, p. 509).

Sport Identification: “A specific instance of social identification whereby the object to which one identifies is a particular sport” (Gwinner & Bennett, 2008, p. 414). A psychological range along which sport fans and spectators can relate to a sport (Funk & James, 2001).

Willingness to Adapt (WTA): A person or organization’s willingness to accept, pay for, or otherwise support climate adaptation (Berkhout et al., 2006).

CHAPTER II

LITERATURE REVIEW

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. The following chapter provides a thorough review of current literature and theoretical frameworks through which this study is framed. The literature review contains three primary sections: (a) climate change, including a review of climate change attitudes, risk perceptions, and adaptation literature, (b) climate change in sport, and (c) an evolution of environmental and social theoretical frameworks to supply the foundation for the present study. As suggested by the United Nations (2018) Sport for Climate Action Framework, sport can be used as an accessible tool to disseminate the realities of climate change in a way that reaches diverse populations. The present study intended to add empirical evidence to this claim, by gaining an understanding of MLB fans' attitudes toward climate change, and if their perceptions of climate change risks and willingness to adapt to climate change were influenced by their sport identification. It is important, however, to first present the scientific issues of, and social responses to, climate change. This grounding helps inform the understanding of individuals' climate change attitudes as well as climate change's relationship with sport. To interpret variations in MLB fans' climate change attitudes, risk perceptions, and

willingness to adapt, the present study utilized social identity theory as the guiding theoretical framework (Tajfel, 1978). Social identity theory helped situate MLB fans' climate change attitudes and risk perceptions within their personal attributes and the social groups to which they belong. Further, social identity theory helped the present study determine if sport identification could influence fans' willingness to adapt to climate change.

The Scientific Issue of Climate Change

The conceptualization of climate change, any variation in climate over time, has faced challenges in the U.S. as media sources and political decision-makers have maintained uncertainty while every major scientific body in the U.S. (e.g., the U.S. Environmental Protection Agency (EPA), and National Oceanic and Atmospheric Administration [NOAA]) assert the contrary (Oreskes, 2004). This uncertainty preventing the American public from being a part of the solution is a symptom of a greater issue. For those outside the scientific community to understand climate change and its effects, a holistic worldview is required (Callison, 2014). However, today's society is built on fracturing and compartmentalizing: either Republican or Democrat, liberal or conservative, left or right, above or below, for or against (Zia & Todd, 2015). Science, however, exists to connect all parts, and give meaning to the grey spaces between. When a scientific issue, like climate change, is obscured by humankind's preference to categorize, few cooperative opportunities exist to be a part of the solution. People need not be scientists nor experience the devastation of climate change's most extreme disasters to work toward resolutions. However, the realities of climate impacts are

repeatedly becoming more first-hand, and are rapidly shifting from unprecedented to expected (Klein, 2020).

Scientific Evidence for Climate Change

The Intergovernmental Panel on Climate Change (IPCC) provides the most comprehensive and widely used scientific foundation of climate change with regular reporting to update the globe on the realities and development of climate change, as well as forecasts for the future and benchmarks for solutions. The most recent IPCC (2018) special report on the state of climate presents findings regarding the observed average increase in global temperatures (1.0°C), and anticipated long-term risks natural and human systems will experience as a result of a 1.5°C average temperature increase. The consensus on the presence of climate change, however, existed for decades prior to this reporting as the scientific community reached agreement on the observability of climate change in the early 2000s (Pielke, 2004; Oreskes, 2004). Largely due to the emission of greenhouse gases (GHGs), Earth's warming alters other natural processes including weather, erosion, and ocean acidification. GHGs are introduced into the atmosphere by modern industrial practices of mining and burning fossil fuels, illustrating humans' influence on the climate since the pre-industrial period (IPCC, 2018; O'Connor et al., 2002).

The side effects of a warming planet provide scientific evidence for climate change in every corner of the earth and, in fact, illustrate how the changes themselves have evolved even since the scientific community reached consensus. The twenty-first century, alone, has marked record-breaking climate benchmarks. For example, nine of the 10 warmest years on record have occurred since 2005 (Lindsey & Dahlman, 2020).

Additionally, global sea level has risen nearly nine inches since 1880, but two of those inches occurred since 2010 (Lindsey, 2020). Currently, 2016 and 2020 are tied for the hottest year on record, both outpacing the 30-year global warming average and exceeding the pre-industrial average by 1.25°C (Kann & Miller, 2021). Together, 2016 and 2020 officially made 2010-2020 the hottest decade ever recorded (Kann & Miller, 2021). Contributing to the unprecedented nature of events in 2020, this year saw a number of climate disasters: the worst wildfire season in the U.S. (Hoover & Hanson, 2021) and extraordinary drought and fire seasons in Australia (van Oldenborgh et al., 2020), extreme Arctic warming (Thoman et al., 2020), and a record-breaking Atlantic hurricane season (Chinchar & Brink, 2020).

At this point, the term climate *change*, appears to be moving toward obsolescence too. In fact, the 2019 Oxford Dictionary word of the year was “climate emergency” (Pytel, 2019). As the year 2020 marked the fifth anniversary of the 2015 Paris Climate Agreement, UN Secretary-General, Antonio Guterres, called on world leaders to declare a state of climate emergency in their home nations (Green & Abnett, 2020). The continuous escalation of climate language parallels the continuously increasing consequences of current climate change effects, and what potential future impacts may be.

Consequences of Current and Future Climate Change Impacts

While the majority of observed climatic changes are seen through meteorological, or weather-related, changes, there are long-term impacts climate change poses to the planet. These consequences range from depletion of biodiversity, to global health issues, and unstable political economies worldwide. So, while a 2-inch rise in sea level or 2-

degree increase in temperature may appear insignificant, the magnitude of these changes creates exponentially detrimental consequences for life on earth.

Biological diversity, or biodiversity, refers to all living organisms in a given area (Pearce, 2003). For example, the biodiversity of a coral reef (fishes, corals, algae) will look much different from the biodiversity of a rainforest (trees, birds, insects). In either setting, each organism is vital to the structure and survival of the biome. Climate change directly compromises biodiversity by altering the conditions organisms need to survive. Climate change also threatens biological resources, or the economic value of biodiversity for humans, by depleting biological components humans use (e.g., trees for lumber, plants and animals for food). Not only is biodiversity essential to maintain the lifecycles on Earth, it has an economic value to humans that climate change jeopardizes (Pearce, 2003; Pearce & Moran, 1994).

In a similar manner, climate change catalyzes present global health issues, and gives rise to unprecedented future concerns. For example, the same biological and economic concerns regarding the depletion of biodiversity can also be applied to global hunger rates. Bloem et al. (2010) found climate change to affect the global economy, in turn challenging affordable food prices and access to food, exacerbating malnutrition and hunger. Additionally, the deteriorating natural environment due to climate change directly correlates with physical (Solomon & LaRocque, 2019) and mental (Berry et al., 2010) health issues, including infectious (Ogden & Gachon, 2019) and chronic disease (Kjellstrom et al., 2010).

Likewise, climate change is often the source of unstable political economies due to climate-related uncertainties in extractive industries (Tanner & Allouche, 2011).

Extractive industries, or businesses that require the harvesting or collecting of a good, include oil and gas mining, forestry, agriculture, farming, and fishing. Adaptive climate solutions are necessary to curtail the destruction of the systems that keep humans alive, the environment intact, and society's systems functioning (Addison & Roe, 2018; Lunstrum et al., 2015).

Future Projections of the Worsening of Climate Change

Climate affects different communities, people, and social systems like companies, governments, and institutions in different ways. Much like the analogy that everyone is in the same storm, but not in the same boat, geographic distribution influences the way climate change is realized for any person or entity. For example, poorer developing countries not only rely on cheap, harmful energy sources, but do not have the financial capital to recover from and mitigate climate impacts (Elum & Momodu, 2017). Meanwhile, industrialized nations, like the U.S., are afforded resources to seemingly distance or shield themselves from the harsh reality many countries face (Spence et al., 2011). In fact, in highly-developed nations, climate change is predominantly observed solely through meteorological changes (Egan & Mullin, 2017). For decades in the U.S., changes in climate have been quantified primarily on the basis of extreme weather conditions: persistence and severity of droughts, changes in precipitation frequencies and amounts, and occurrences of severe weather events like hurricanes, wildfires, and tornadoes (Karl et al., 1995). Even then, these events exacerbate existing inequalities in developed countries that make marginalized and disadvantaged groups of people more vulnerable than others (Hsiang et al., 2017). Variations in climate exposure is not

something any group or government can control, however adaptations to climate change are manageable and controllable.

Awareness of the realities of climate change have allowed societal adaptations to run the gambit, e.g., renewable energy sources, electric vehicles, emission reductions, and waste diversion. However, there are challenges in making these opportunities widespread, affordable, and available globally. Although disputed in the general public (Dunlap & McCright, 2011; Mian & Kahn, 2020), the scientific community reached consensus about climate change's presence and influence of human activity, anthropogenic causation, in the early 2000s (IPCC, 2018). The scientific consensus despite the complicated nature of climate change further necessitates the need to ensure consensus can be reached across the general public.

Climate Change Attitudes and Risk Perceptions

Scientific distrust and the perception of factual ambivalence on the topic have contributed to a range of climate change attitudes across the general public (Whitmarsh, 2011). The scientific issue itself shapes social responses to climate change. Two of the primary attitudes driving an individual's social responses to climate change are skepticism and experiential processing, both of which are discussed in detail below.

Climate Change Attitudes: Skepticism and Experiential Processing

Skepticism regarding climate change is characterized by uncertainty, or disagreement, that overpowers factual evidence, which Corner et al. (2012) found to be a notable barrier to the general public's engagement with climate action. In fact, Whitmarsh (2011) considers the subjective nature of climate understanding, creating an opportunity for skepticism to be prevalent, to be the root cause of "attitudinal (and

behavioral) heterogeneity” (p. 691). Variations in climate change skepticism have been extensively examined and attributed to demographic and social groupings like age (Ross et al., 2019; Stevenson et al., 2014), gender (Davidson & Haan, 2012; McCright, 2010), race and ethnicity (Macias, 2016), socio-economic status (Bohr, 2014; Longo & Baker, 2014), education level (Lee et al., 2015), and educational program of study (Huxster et al., 2015). Skepticism, often conflated with uncertainty and doubt, is generally not expressed as complete disbelief in the presence of climate change (Sunstein et al., 2017). Instead, climate change skeptics tend to be more wary about the severity and causation of climate change (Carrus et al., 2018). For this reason, the assessment of additional mental (sensory) and physical (experiential) models beyond that of cognition are needed to fully understand a person’s climate change attitudes.

Experiential processing refers to the methods by which a person gains information and knowledge through the things they see, feel, and do. Psychologically, Gadeikis et al. (2017) categorize experiential processing into sensory and bodily realms. This categorization is consistent in climate studies as well: generalized emotion (sensory) and personal experiences (bodily; van der Linden, 2015). Understanding generalized emotions (i.e., affect) helps assess a person’s climate change attitudes based on how they feel (Lowenstein et al., 2001). Generalized emotions, or how one feels about climate change and its risks, is an effective attitudinal measure particularly as the realities of climate change are associated with destruction and despair (Spence et al., 2011; Sundblad et al., 2007). Assessing experiential processing of climate change through personal experiences allows connections to be made between climate change, weather events and patterns, and lived experiences (van der Linden, 2015).

Experiential processing's sensory and bodily dimensions enhance the lateral spectrum of climate change attitudes ranging from skeptic to believer, and create additional points of attachment for an individual to understand climate issues (Marx et al., 2007). Additionally, experiential processing, like skepticism, has been found to be a strong indicator of a person's climate change risk perceptions, particularly as the realities of climate change are felt through experiences and loss (Haltinner & Sarathchandra, 2018). Furthermore, experiential processing in environmental studies has also been found to be a predictor of a person's intentions to engage in climate adaptation and support adaptive strategies (Broomell et al., 2015). Although experiential processing exists to make climate change less of an abstract science, the issue itself is complicated and easily misconstrued (Smith & Joffe, 2013).

Complexity and Framing

The development and shaping of climate change attitudes are further informed by the complexities of climate change, how climate change information is framed, and a person's ideologies (e.g., religious and political affiliation). These factors also help to explain the social nature of climate change studies beyond the scientific facts. Social responses to climate change are often due to how climate science is presented to the general public, creating an opportunity for subjectivity. Hoffman (2015) noted that the overwhelming amount of climate change rejection is due to the evasion of scientific information. This information avoidance, according to Hoffman (2015), is due to an individual's presuppositions that are formed by the cognitive filters that frame their worldviews. The climate change debate becomes less about science, and more of a socio-cultural issue. An individual's disposition to accept or reject the notion that climate

change exists is determined by their cultural identifiers, communities, and environments, often overpowering that of scientific reason (Hoffman, 2015).

Framing the way climate change is communicated has been shown to influence the way climate change's risks are perceived (Spence & Pidgeon, 2010). Communicating the realities of climate change to the general public relies considerably on scientific models that make sense of its occurrence. Climate scientists understand the comprehensive nature of climate models, which ensure pertinent details are included, can overcomplicate the core issues of climate change for the general public (Palmer & Stevens, 2019). While climate scientists have reached consensus regarding the presence of climate change, observed primarily by overwhelming increases in average global temperatures, herein lies the central issue of societal consensus: growing comprehensive scientific models of climate change as it continuously evolves, becomes increasingly challenging to convey the science to the general public.

Ideological Influences on Climate Change Attitudes

Ideological responses to scientific issues are further shaped by the issue's complexity and the way it is framed. Various areas inform and instill an individual's attitudes toward climate change. Two of the most prominent social and ideological influencers of climate change attitudes and risk perceptions are religious beliefs and political orientation.

Religious Beliefs. Climate change science has been a source of religious contention (Evans & Feng, 2012; Smith & Leiserowitz, 2012). For example, Morrison et al. (2015) found different religious beliefs to explain belief differences in climate change's causation, the scientific consensus, and policy support. Additionally, Ecklund et

al. (2017) explored the role Evangelical Protestantism plays in the rejection of climate change science, finding media portrayals, religious ideology, and education lead discussions away from scientific fact and into personal belief systems. This finding reinforces the notion that a person's attitudes are informed by their beliefs (Ecklund et al., 2017; Kellstedt et al., 2008; Morrison et al., 2015).

Because climate change and its adverse effects are interwoven in culture and society, it is imperative to consider the role religious beliefs have on a person's climate change attitudes. It is important to note, however, that understanding climate change through religious lenses does not necessitate truth or helpfulness regarding the scientific phenomenon. This notion is reinforced by Jenkins et al. (2018), who assert religious studies are integral to fully understanding climate change's meaning in society, but is understudied perhaps due to the complicated instability of faith and science. Further, Jenkins et al. (2018) acknowledge religion's role in influencing climate change attitudes, and write, "some religious identities are caught up in denialist politics...and religious dynamics can intensify cultural conflicts" (p. 86).

However, Ecklund et al. (2017) suggested the marriage between religion and politics in the U.S. influences personal beliefs, and fuels an "antiscience narrative," which directly combats scientific phenomena like climate change and evolution (p. 986). While this narrative intensifies science-based skepticism, Ecklund et al. (2017) found climate change skepticism more closely aligned with an individual's political stance and scientific trust than with religion, noting "the two forms of skepticism only appear to overlap because they both dip into a similar, politically conservative population with as a whole lower levels of confidence in the scientific community" (p. 1000). These findings

are consistent with Smith and Leiserowitz's (2013) determination that scientific beliefs can vary within single religious denominations, signifying additional personal and social identifiers, such as political affiliation, contribute to climate change attitudes.

Political Identification and Political Conservatism. The media's framing of climate change, thus climate change's diffusion to the general public, has long been subject to political influence (Freudenberg & Muselli, 2010; Mazur, 1998). However, this is not an occurrence unique to U.S. politics. In fact, Dotson et al. (2012) assessed differences in public awareness on climate change as a result of media framing in Chile, finding greater coverage amounts, more negative and severe stories, and fewer opinion-based sources in liberal news outlets as opposed to conservative news outlets. Dotson et al. (2012) did, however, find comparable amounts of government-based references in both liberal and conservative newspapers, illustrating the influence of politics and national policy on Chile's climate change news as opposed to science. Political influence and political identification's roles in shaping climate science beliefs are likewise consistent across the U.S. and European nations (Armitage, 2005). Conservative political dispositions have consistently endorsed climate change doubt and opposed climate action (Armitage, 2005; Carrus et al., 2018; Gifford, 2011).

However, ideological influence regarding climate change in the U.S. is of particular interest due to the role of political debate in American history. Disparities in climate change support is largely due to political polarization and the way environmental issues are framed by political partisanship in the U.S. (Wolsko et al., 2016). However, the sheer existence of political polarization is even debated in the U.S. (DiMaggio et al., 1996; Fiorina et al., 2005; Green et al., 2004). What remains consistent, still, are the

earmarks of American history that are rooted in political differences: from the American Civil War and New Deal Era, to women's rights and racial equality, where "our political institutions and policy-making processes have withstood sharp divisions between the parties" (Brady & Han, 2006, p. 120). Likewise, climate science in the U.S. is highly politicized and split on this bipartisan fault line (Fisher et al., 2013; Unsworth & Fielding, 2014). The political divide on climate change beliefs amongst Americans has been growing since the 1990s, punctuated by environmental action from former Vice President Al Gore, and former President Barack Obama, and inaction from former President Donald Trump (Antonio & Brulle, 2011; De Pryck & Gemenne, 2017; Dunlap et al., 2016; Nisbet, 2009). Situating climate change beliefs on a bipartisan split in the U.S. naturally leads to polarization on the topic. McCright and Dunlap (2011a) credit the high political polarization of climate change in the United States to divisive political and economic policy on the topic, finding climate change skepticism primarily presents among conservatives, Republicans, males, religious persons, and individuals who did not support the environmental movement. McCright and Dunlap (2011b) note in spite of the U.S.'s "long-term, laggard response to climate change," a stark divide exists in climate change beliefs and support between conservatives and Republicans versus liberals and Democrats (p. 155).

Climate Change Risk Perceptions

Perceptions of climate change risk demonstrate an individual's understanding of climate change's causes and effects (Swim et al., 2009). This directly incorporates beliefs, which can vary, into the range of possible risk perceptions (Weber & Sonka, 1994). Risk perceptions are also influenced by the way the realities of climate change are

communicated (O'Connor et al., 2002), much like the messaging in the Chilean news sources (Dotson et al., 2012). Effects of climate change, and subsequent risk perceptions, mirror societal inequalities as well. Individuals, nations, and entire regions that are marginalized or rank lower socioeconomically are more likely to have greater risk perceptions, feel the effects of climate change, yet be less likely to have the resources to overcome those effects (Sengupta, 2020). These discrepancies further compromise underdeveloped areas and the people who live there. The United States, however, is afforded a cushion of resources that seemingly obscure the realities of climate change from the population's everyday lives and their perceptions of risk (Lo & Chow, 2015). In reality, even the most developed nations and wealthy people are not immune to the effects of climate change. One way to observe these effects is by examining the relationship between sport and climate change in highly developed and industrialized countries like the United States.

Climate change risk perceptions are associated with levels of concern, which drop for Americans when concerns for the economy and terrorism rise (Weber, 2016). This finding suggests Americans' concerns are influenced by issues that seemingly pose more pressing risks. This is confirmed by Morton et al. (2011), who wrote, "[although] it maybe be one of the most important issues currently facing humanity, as an issue of personal concern climate change remains quite distant from the lives and thoughts of most individuals, at least in the developed world" (p. 103). Climate change has typically not fallen into the category of most pressing risks because it is rather difficult to observe personally on a regular basis. Swim et al. (2009) observed people are more generally

concerned about day-to-day weather patterns than cumulative changes in climate. They note:

While a region's climate and changes in its climate obviously determine its weather patterns, weather events—event extreme ones—are not necessarily diagnostic of changes in the climate. Climate change is a trend in averages and extremes of temperature, precipitation, and other parameters that are embedded in a lot of variability, making it very difficult to identify from personal experience. (p. 33)

These natural disasters and events of extreme weather that alter the biophysical environment of North America not only provide points of comparison to other climatic changes, but are seen as catalysts for climate change attention and action (Huber & Gullede, 2011; Swim et al., 2009). For example, the years following 2005's Hurricane Katrina saw a considerable increase in research on mitigating climate change risks, and encouraging adaptation, with insurance (Charpentier, 2008; Hecht, 2007; Mills, 2005; Richards, 2016).

Kellstedt et al. (2008) suggest the general public's lower perception of climate change risk than the scientific community's is due to a lack of knowledge and personal connection to the issue, despite the rise in events like Hurricane Katrina. Existing research has strongly correlated climate change risk perceptions with group-oriented factors like demographic features, and ideological traits (Leiserowitz, 2004). Sociological frames and inroads, like those detailed in this section, help people understand their experiences with climate change and what their contributions could be. One of these inroads, as suggested by this study, is sport and the social dynamic of sport. In fact,

several sport scholars have suggested and proven sport can be levered to encourage pro-environmental behavior (Inoue & Kent, 2012; Trail & McCullough, 2020). Sport as a tool for climate action has been ratified by the United Nations Sport for Climate Action Framework to specifically highlight the unique position of sport and its platform to influence climate attitudes (McCullough et al., 2020). Further, the Obama Administration also identified sport as an avenue to influence climate change perceptions, ideas, and actions in the 2016 announcement of Green Sports Day (Trendafilova & McCullough, 2018). Despite skepticism, denial, and delayism, there are exciting opportunities in sport to corroborate, communicate, and confront the realities of climate change, especially as they relate to a person's understanding of the issue.

Climate Change Vulnerability and Adaptation in Sport

Because climate change attitudes, support, and action are influenced by risk perception which stem from the actualization of threat or harm, the present study sought to determine if sport-specific climate change threats shape the way sport fans perceive the realities of climate change. In fact, climate studies are emerging in sport as evidence of climate change's effects on sport, and sport's ability to enact pro-environmental change. This is due, in large part, to the accelerating challenges climate changes poses to the sport sector. The sport industry provides a realm through which the effects of climate change are particularly tangible, despite the industrialization or development of a given country or region. For example, Bürki et al. (2003) assessed climate vulnerability in Sweden, Australia, and Canada – wealthy, developed nations that support regions reliant upon snow sport tourism.

At the same time, the sport industry plays a significant role in the state of the global climate, illustrating the bidirectional nature of sport ecology research. The UN has served as a leader for standard global climate action for decades, and more recently has addressed sport as a key player in the current climate crisis with the United Nations Framework Convention on Climate Change. The UNFCCC recognizes the detrimental impacts the sport industry has on climate change, and asserts sport is a highly visible tool for promoting carbon footprint and waste reductions while incentivizing pro-environmental actions across other industries (UNFCCC, 2017). As a result, the UN developed a framework for sport to act as a tool for global action for climate change minimization (United Nations, 2018). Along with the International Olympic Committee (IOC), the UN sector for climate change constructed this framework to provide sport entities with a plan and standards for tackling climate change in accordance with the Paris Climate Agreement. To gain a better understanding on how sport can be leveraged for climate action, it is important to first understand the threats climate change poses to sport, and how sport entities respond to those threats.

It is also important to note that sport, for Americans, is evidence of how immediately threatening climate change is. This phenomenon can be observed by the activation of sustainable and pro-environmental responses and practices among sport organizations and fans. However, not all pro-environmental behaviors insulate a person or community from climate hazards. For example, recycling or taking public transit, although beneficial, does not reduce a person's vulnerability to a hurricane or wildfire. Different actions are needed to adapt to these very real threats (Füssel, 2007). Therefore, there are two types of climate action which are equally important but asymmetrically

studied. Studied extensively in sport ecology research is the activation of sustainable and pro-environmental practices that will mediate future climate impacts (McCullough et al., 2020). The present study focuses on adaptive responses to protect sport organizations and fans from existing climate impact, an area where research is burgeoning. Thus, the next section details some of these existing climate challenges that necessitate action.

Climate Change Vulnerability in Sport

As sport, sport tourism, and outdoor recreation continue to grow as industries, they each become increasingly more reliant on favorable weather conditions and dependable climate (Smith, 1993). Climatic changes on Earth spawn changes in weather conditions, often resulting in events of extreme weather and heat (IPCC, 2018). These occurrences require the alteration, or cancellation, of the way sport is played. Despite decades of research on the impacts of weather on sport (Kay & Vamplew, 2006; Smith, 1993; Thornes, 1977), unprecedented changes in weather patterns due to climate change warrant the scholarly visitation of these effects regardless of sport type or geographic region. Extreme weather events pose unique threats to sport, and make organizations particularly vulnerable to the impacts of the natural environment (Orr & Inoue, 2019). Unfortunately, as these events become more frequent, society grows accustomed to them, and nearly expects them (Sniffen, 2007). Acclimatization to events of extreme weather and heat, or even preparation, will not prevent their occurrence.

Snow and Heat

Snow-based winter sports are particularly vulnerable to fluctuations in climate. Unlike other elements of climate, snow is fairly easy to observe and measure. This is why reductions in snow cover, amount of snowfall, and length of snow seasons are tangible

tools to evaluate climate change (Bürki et al., 2003; Rixen et al., 2011). Sports like cross-country skiing are both snow reliable and snow dependent, and organizations and communities that support snow-based sports are concerned with adequate quantities of snow to support them. Bürki et al. (2003) identify “global warming will be strong on land surface, [in] the northern hemisphere and in winter,” which pinpoints the home of mountainous winter sports tourism (p. 2). Beyond snow cover loss, Bürki et al. (2003) found less snow and fewer glaciers endanger snow tourism, while landslides from catastrophic melting pose severe economic and safety threats to these communities. Additionally, the winter sport seasons are being shortened as snow and ice become less available, and even fewer countries are bidding and able to host the Winter Olympic Games (Goldblatt, 2020). In fact, Pierre-Louis and Popovich (2018) reported in *The New York Times* that by 2080, only six former host cities of the Winter Olympic Games will remain viably cold enough. These changes are affecting humans in mounting ways: athletes with resources are chasing snow and ice for opportunities to participate (VICE Sports, 2015), and events are following snow by moving higher up in altitude, affecting human health (Janssen et al., 2015; Rixen et al., 2011).

Extreme Weather

Extreme weather events are often the most tangible observations of a changing climate over the course of a person’s life (Spence et al., 2011). Because climate change is measured over time, often centuries, it cannot be directly experienced (Whitmarsh, 2008). However, earmarking climate change with record-breaking extreme weather events, increasing in severity (Weber & Stern, 2011), and frequency (Murfree & Moorman, 2021), help demonstrate the reality of a changing climate. Extreme weather events

catalyzed and exacerbated by climate change include wildfires, droughts, heat waves, flooding, tropical cyclones/hurricanes, tsunamis and tornadoes (Hoover & Hanson; Murfree & Moorman, 2021; Zanocco et al., 2019). Experiencing extreme weather events, while becoming more common, is also a main driver of a person's climate change risk perceptions (van der Linden, 2015). Further, these events, rather than gradual increases in average atmospheric temperature, directly inhibit the enjoyment of sport (Murfree & Moorman, 2021).

Human Health

Implications for human health as a result of climate change will bring continuous uncertainties as long as climate change threats are widespread. This is largely due to rapid global changes, and ranges of short- and long-term potential impacts. For example, as snow sports ascend to higher altitudes, there exists a greater need to protect athletes from increased sun damage that could lead to skin cancer (Janssen et al., 2015). Smith et al. (2016, p. 1) acknowledge the short-term impacts from climate change-initiated events can be mediated, but by 2050, the speed of climate change and magnitude of ancillary events (e.g., hurricanes and wildfires) may be higher than society's "ability to adapt." Smith et al. (2016) specifically explored health-related adaptations by observing the impacts of extreme heat and heat waves on Olympic endurance athletes, finding athletes experience a range of health risks from heat stress to life-threatening heat strokes. Smith et al. (2016) suggest there is an escalating need to protect elite athletes from the effects of climate change as only 7% of currently potential Summer Olympic host cities would remain viable by 2085.

Climate Change Adaptation in Sport

Climate change exposure and sensitivity are the contributors to an entity's climate vulnerability (Orr & Inoue, 2019). Climate adaptation serves as the response to vulnerabilities via behavioral changes in light of climatic risks (Berkhout et al., 2006). Climate change adaptation is particularly important from individual and managerial standpoints, because while present climate change risks cannot be stopped (i.e., the MLB cannot prevent storm delays), adaptation is directly manageable. Therefore, assessments of fans' or sport organizations' willingness to be involved or change behaviors as a direct result of climate vulnerability can provide direct support for the UN's Sport for Climate Action Framework.

Assessing adaptation in a sport context asks how willing a sport fan might be to do something about their perceptions of a given risk. In this situation, there are adaptive options used in sport research to help frame managerial implications to climate risks: willingness to pay, and substitutions (Dawson et al., 2013; Linnenluecke et al., 2013; Orr, 2020). Willingness to pay (WTP) asks consumers how willing they are to pay more for various adaptation options. In an MLB setting, these options could be paying for a climate-controlled (roofed) stadium, or the price of offsetting a team's carbon emissions becoming included in the ticket price. However, in a fan's personal life, willingness to pay options include paying more for electricity and fuel, or paying to offset personal carbon emissions (Xie et al., 2019). Substitutions, the second option, suggests there are three possible ways to substitute any product or activity: place, time, or the activity itself (Dawson et al., 2013; Orr & Schneider, 2018). In this case, MLB fans should be asked if they are willing to substitute the place, or aspects of the place, where their favorite team competes, (e.g., willingness to play at an indoor facility, willing to substitute the game

time or date, or willing to forego their baseball fandom for a different sport altogether). In a fan's personal life, substitutions include travelling by car or plane less frequently, choosing to purchase consumer goods from sustainable corporations, or opting for more expensive, energy-efficient appliances and electronics (Xie et al., 2019).

Climate change threatens sport in a way requiring drastic managerial and personal change (Orr, 2020). The sport industry's increasing exposure, sensitivity, and climate-dependability directly influence the ability for sport to occur, because the industry relies on consumers' propensity and ability to travel and participate (Smith, 1993). Climate change hazards are not limited to snowy or coastal regions, as climate changes spike the frequency and severity of global extreme weather events. Therefore, it is necessary for sport organizations and consumers to possess a greater understanding of climate change and its repercussions on the ability to enjoy sports. It is also critical for sport organizations to respond and remediate their climate vulnerabilities through proactive and adaptive measures. However, the most prevalent way sport organizations respond to the consequential decline in the state of the natural environment is through environmental sustainability (ES).

Organizational efforts to increase environmental awareness and ES can aid in improving global well-being and climate impacts, and many sport industry segments are addressing drastic climate and environmental issues. For example, Dingle and Stewart (2018) examined major Australian sport stadia (MASS) climate impact mitigation strategies, finding stadium owners and managers acknowledged potential organizational threat, but they did not necessarily feel vulnerable to the effects of climate change. In the United Kingdom Kay and Vamplew (2006) recognized some climate action in the British

sport sector, noting climate change attitudes limited organizational responses to extreme weather. When considering the future longevity of British sport clubs, Kay and Vamplew (2006, p. 103) conclude perhaps “only the wealthiest organizations could afford to weatherproof facilities.” The most valuable sport brands and teams are concentrated in the United States, with Nike, ESPN, and Gatorade (Ozanian, 2019), and the Dallas Cowboys, New York Yankees, New York Knicks, Los Angeles Lakers, and Golden State Warriors (Badenhausen, 2020) beating out international entities. Mallen et al. (2010) found sport facility managers in the U.S. recognized the significance of ES in mitigating sport’s inherent contributions to the earth’s climate. These positive trends are evidence that ES activities are emerging among sport facility management best practices in three highly-developed countries.

While sport facilities are the first line of defense between elements of the environment and the people and sporting events inside, sport organizations also leverage ES through fan engagement (Casper et al., 2020; Kellison & Orr, 2020; McCullough & Kellison, 2016). International sport and entertainment consulting firm, The Gemba Group (2019), posit ES is the most critical social issue because of irreversible effects on the planet caused by humans, yet sport can act as a change agent by channeling fans’ passions and directing them toward sustainable industry practices, with the goal of funneling further sustainable activity into the greater society. In an analysis of the four major sport leagues in the U.S., (NBA, NFL, NHL, and MLB), Trendafilova and Babiak (2013) found team and league executives felt it is their responsibility to lead pro-environmental organizations. Likewise, Casper et al. (2014) found fans of an NCAA

Division I BCS athletic program felt college athletic departments also have a responsibility to act with environmental consciousness.

Because the complexity and framing of environmental issues shape the public's understanding, communicating these issues through sport is vital if sport is to serve as a tool for environmental and climate awareness. Mallen et al. (2013, p. 115), suggesting the sport industry is not "immune from ecological challenges," and the topic's complexity should be studied specifically, sought to determine how sport organizations communicate their participation in ES by specifically focusing on the websites of facilities that housed a Major League Soccer (MLS) franchise in 2011. Through brand theory and the Sport Event Environmental Performance Measurement (SE-EPM), Mallen et al. (2013) found each of the facilities communicated some form of ES action and that communication of ES initiatives is increasing. This case study's focus on facility management suggests there is a league-centered attempt to address environmental issues: where new facilities are constructed with the environment in mind, and sustainable operations are integrated into existing venues.

Like the MLS, MLB also takes a league-centered approach to its responses to climate and environmental issues. For example, MLB was the first professional sports league in the U.S. to have all teams become members of the Green Sports Alliance and celebrates Earth Day each year with league-wide pro-environmental initiatives (MLB, 2019). In addition to promoting ES, MLB also makes considerations with respect to athlete and consumer environmental well-being. In 2020, the Texas Rangers moved to replace their traditional open-air stadium with a retractable roofed playing facility to meet the comfort needs of their fanbase, and to ensure games can be played despite adverse

weather forecasts (Grant, 2019). Simultaneously, the roofed Globe Life Field now protects and preserves baseball from extreme heat and precipitation in Dallas, and provides a climate-controlled environment for spectators. Despite these organizational attempts to address climate change and environmental issues, there is no quantifiable evidence that these ES decisions were made as a result of climate change, nor an empirical assessment of MLB fans' climate change perceptions in light of these organizational efforts.

In addition to organizational efforts, Inoue and Kent (2012) assert sport organizations can leverage their consumer base to minimize environmental harm by promoting pro-environmental behaviors. If sport organizations can inspire pro-environmental behavior in stakeholders, then the managerial opportunities for sport and the environment will significantly expand (Inoue & Kent, 2012). In order to make such determinations, Inoue and Kent (2012) reinforce extant literature on sport teams and corporate social responsibility (CSR), and recognize sport teams' potential to influence socially beneficial practices. To establish that sport teams can persuade consumers to act for the benefit of the natural environment, the researchers consider consumer support of (1) the team's environmental initiatives, and (2) the intent to incorporate pro-environmental behavior into their daily lives. Their findings suggest athlete involvement in team ES initiatives increases initiative credibility, aiding consumers' ability to internalize those pro-environmental practices, indicating the significance that sports leagues and teams should place on the incorporation of pro-environmental strategies and practices into business plans. Perhaps more important than the strategy itself, is what

sport organizations are doing to offset current climate related harm, and how those efforts are communicated to consumers.

Adaptive responses to present climate threats are major opportunities in that inaction is an action in itself. Sport organizations' adaptive responses to climate change can help proactively preserve the life of the product (Orr & Inoue, 2019). Currently, there is a small body of research on adaptive responses regarding sport managers and decision-makers. Additionally, there is a growing body of research on what constitutes climate adaptive options in the sport industry (Orr & Inoue, 2019; Orr & Schneider, 2018). However, the ways in which fans and consumers perceive climate change risks and engage with adaptive options has yet to be explored. Further, there is very little evidence that sport organizations' responses to environmental pressures and hazards are climate-driven. The majority of this research suggests pro-environmentalism at the organizational level supports efforts for corporate social responsibility, marketing, and fan engagement, rather than honest solutions to, and protections from, climate change. As such, there are few theoretical lenses that address the multitude of different components outlined in this literature review. Rather, there have been paradigmatic shifts that ebb and flow much like social and environmental issues do.

The dearth of research on sport fans' climate change attitudes is surprising given growing environmental understanding, and subsequent action, at the sport organizational level due to the tangible threat climate poses to sport and impetus set by the UN. The lack of coverage and research on these attitudes in response to climate adaptation in the U.S. is equally surprising. Although weather conditions have long been a major consideration for American sport fans opting to view sporting events live (Noll, 1974; Trail et al.,

2008), increased instances of unfavorable climate conditions are expected to increase, thus increasing constraints on possible adaptive responses to climate vulnerability in sport (Egan & Mullin, 2016). A particular need exists to understand sport fans' perceptions of climate change given the unique climate vulnerability sport has.

Theoretical Framework

Climate change studies and sport ecology are interdisciplinary by nature, just as identity studies in sport management research are. Therefore, it was critical to examine the aforementioned hypotheses with an interdisciplinary approach as well. The next sections delineate traditional approaches to studying environmental attitudes and behaviors, and a move toward social identity theory which has historically framed the social and personal attributes that can influence a sport fan. The present study suggests social identity theory can frame the social and personal attributes that may guide an MLB fan's climate change attitudes, risk perceptions, and willingness to adapt.

Evolution of Environmental Identity Theories

Climate change attitudes, risk perceptions, or adaptations have not definitively been studied amongst sport fans, despite their essential role in the sport landscape. Further from a managerial standpoint, sport management scholars are interested in what a sport manager can do and control. This sentiment is what typically guides the theoretical framework in sport management studies. However, sport managers cannot change climate, or people's beliefs necessarily, but they can control managerial implications as a result of climate risks to sport by knowing what sport fans are willing to do as a result of their climate own change risk perceptions. Further, sport managers can gauge the reception and success of their own ES initiatives by knowing more about their consumer.

In building bridges between consumer, sport, and environmental studies, several theoretical frameworks exist to help explain how a person might orient their climate change attitudes and environmental behaviors. A brief understanding of the development and evolution of these theories gives contextual meaning to the use of social identity theory to frame the present study.

New Ecological Paradigm

The New Environmental Paradigm (NEP) or original NEP was developed by Dunlap and van Liere (1978) to address growing environmental concerns in the U.S. The NEP scale is intended to address and measure the degree to which a person upholds a worldview that favors the natural environment (Anderson, 2012). Revisions to the original 1978 NEP occurred to address criticisms of its poor correlation between measures and a person's actions, and outdated and inaccurate language (e.g., environmental vs. ecological; Dunlap et al., 2000). The revised New Ecological Paradigm, or revised NEP (Dunlap et al., 2000), contains 15 Likert-scale items and has been widely used in cross-sectional quantitative inquiries into Americans' worldviews, but has also been applied specifically toward addressing "attitudes on public policy...recreation participation patterns, and...pro-environmental behaviors" (Anderson, 2012, p. 261).

Stern et al. (1995) found the NEP scale, although very widely used, to be "indistinguishable from a scale of awareness of consequences (AC) of general environmental conditions, both psychometrically and in terms of its relations to behavioral intentions" (p. 723). While researchers have called for continuous revisions to the NEP, it remains widely used in environmental social sciences. However, one

shortcoming that remains despite the growing measurement of trends and environmental paradigm shifts is that these efforts lack a theoretical grounding by not considering the origins and formations of the environmental attitudes which shape a person's responses to the NEP scale items (Stern, 1992).

Theory of Planned Behavior

The Theory of Planned Behavior (TPB; Ajzen, 1991), while not atheoretical like criticisms of the NEP claim, was developed to predict behaviors and behavioral intentions based on attitudes. When applied to environmental conservation, the TPB posits an individual's decision to be environmentally conservative is "grounded in self-interest-based and rational-choice-based deliberation," suggesting choice and intention could explain the way a person engages in pro-environmental behavior (Kaiser et al., 2005, p. 2151). However, critics of the TPB posit the theory excludes moral and ethical drivers that serve as antecedents to a person's decision to act, or intention to act (Kaiser et al., 2005; Manstead, 2000). Conservation psychologists suggest predictable patterns may help explain specific pro-environmental acts, like choosing to ride public transit, but that not all intentions or behaviors are necessarily planned. Rather, elements of pro-environmentalism can also be attributed to a person's values and beliefs.

Value-Belief-Norm Theory

Critiques of the NEP and the TPB led to the development of the value-belief-norm (VBN) theory of environmentalism, which is rooted in psychology and aims to parse out individual traits and motivators leading a person to environmentally sustainable attitudes and behaviors (Stern et al., 1999). Stern et al. (1999) posit an individual's cognitive reasoning through their environmental values, beliefs in environmental

consequences, and beliefs in consequences of pro-environmental inactivity, represent strong indicators of their sustainable behavior. Further, Stern et al. (1999) suggest support for environmental and ecological movements can become central pieces of a person's identity, and lead to behavioral changes and activism. Contextually, researchers have applied VBN to explore normative actions regarding sustainable transportation (Lind et al., 2015; Nordlund & Garvill, 2003), purchase intentions (Han, 2015; López-Mosquera & Sánchez, 2012), and food consumption (Honkanen et al., 2006; Vermeir & Verbeke, 2008).

VBN sequentially addresses the identifying factors driving a person's support for an item of value or cause, i.e., the natural environment (Stern, 2000; Stern et al., 1999). Illustrated as a causal chain, VBN posits environmental behavior is initiated by an individual's personal norms, which develop from their beliefs, and beliefs are shaped by the person's values (Stern et al., 1999).

Lind et al. (2015) sought to determine if positive environmental outcomes could shape personal norms related to the use of sustainable transportation in Norway's urban regions. Measuring participants' ($n = 1043$) guiding values, environmental beliefs, and personal norms regarding transportation use, Lind et al. (2015) found VBN a successful tool for explaining choice of transportation, "when controlling for situational factors" (p. 123). However, while values and beliefs significantly influenced the amount of variance explained in pro-environmental personal norms, supporting the use of VBN, they only explained 58% of the variance (Lind et al., 2015). This finding suggests social and contextual situational factors outside the scope of VBN may be meaningful in explaining

sustainable choices. These situational, or contextual, factors that influence pro-environmental norms link VBN to studies on culture.

Sport management research has the flexibility to draw upon interdisciplinary business practices and scholarship, and the recent adoption of sustainable sport practices worldwide has warranted the application of environmental theory to sport ecology research. VBN's application to sport management settings has included sustainable promotion engagement (Casper et al., 2014), and pro-environmental practices for park and sport facility management (Lee & Jeong, 2018; Walker & Mercado, 2015). Likewise, Casper and Pfahl (2012) administered a questionnaire to assess the values (i.e., protecting the environment and nature, minimizing harmful impacts), beliefs (i.e., humans detrimentally impact the environment) and norms (i.e., personal responsibility to conserve natural resources) of undergraduate sport and recreation management students, where findings validated VBN's causal chain.

Research linking VBN's application to sport management research has centered on an added benefit to each study's participants. Casper and Pfahl (2012) surveyed sport management students who have a vested interest in pursuing careers in this field, while Casper et al. (2014) sought to understand college football fans' environmental behavior intentions during a football game with promotional initiatives and incentives geared toward sustainability. Conversely, the present study aims to extend this research by considering sport fans' stance on climate-related issues in the absence of these persuasive factors.

Sanderson and Curtis (2016) write, "Cultural factors—values, beliefs, and norms—provide important insights into the environmental attitudes, risk perceptions, and

behaviors of the general population” (p. 284). In their examination of climate change risk perceptions of farmers, Sanderson and Curtis (2016) suggest culture is interwoven through human social groups, like that of farmers, from which values, thoughts, and behaviors stem. The researchers suggest it is impractical to discuss VBN and omit cultural components. This assertion is supported by sustainability research calling for further exploration on how culture shapes scientific decision-making (Caldas et al., 2015). These components link together how a person creates their sense of self, self-expectations, and goals, which are deeply reflective of their personality, much like social identity theory.

Social Identity Theory

Developed as a psychological approach to understand self-conceptualization, social psychologist Henri Tajfel’s (1978) social identity theory suggests individuals create self-meaning by belonging to social groups. The psychological approach to group membership association reveals social underpinnings are involved in how a person constructs their own identity. Turner et al. (1979) found individuals perceived their personal favorability increased due to their belonging to favorable social groups.

Identity theorists examine the components of one’s identity, or the process of identification, by categorizing components of identity into groups to derive meaning (McCall & Simmons, 1966; Stets & Burke, 2000). Unlike personal identity, which considers the self as an object to be sorted through, social identity theory situates those personal categorizations into the larger landscape of group settings (McCall & Simmons, 1966). Derived from social comparison theory (Festinger, 1954), social identity theory addresses cultural and environmental variables that influence an individual’s makeup.

Social interactions via group affiliation mold a person's attitudes and beliefs as well as how they consume information (Tajfel & Turner, 1986, Turner et al., 1994). Additionally, social identity theorists posit personal attributes and traits are sacrificed to embody those of the ingroup, as a person's sense of self becomes more grounded in group identifiers (Heere & James, 2007; Tajfel, 1978).

As a result of decades of Tajfel's pioneering, researchers have broadly applied social identity theory to construct meaning and establish group norms across social settings with respect to racial and gender identities (Rockquemore et al., 2009; Thibeault et al., 2018), workplace behavior (Choi et al., 2017; Ellemers et al., 2003), and political partisanship (Bond et al., 2018; Huddy, 2001). These social aggregates have been found to generate a group sense of belonging while also contributing to an individual's self-conceptualization, reinforcing the notion that a person is a product of their surroundings (Corbett, 2019; Hogg et al., 1995). Identification based on socially defined groups has an influence on the ways a person develops their self-imagery, typically in conformation of the group (Hogg, 2003). Fielding and Hornsey (2016) suggest social identity theory and VBN theory outwardly appear paradoxical because the former is centralized on social norms while the latter takes a personal perspective. Yet they argue "the social identity approach conceives of the self as made up of social identity and personal identities and so these two approaches are not contradictory" (p. 6). It is this point that suggests perhaps the comprehensiveness of social identity theory allows this theory to be applicable in addressing the social nature of climate change and environmental issues in sport.

Social Identity Theory in Sport

Sport fans, as a group that would hold norms (Madrigal, 2000), and their behaviors have also been scrutinized via social identity theory (Branscombe & Wann, 1991; Heere & James, 2007; Wann, & Branscombe, 1993). The theory's applicability to sport management research is traditionally centered on team identification and fandom, largely due to a gap in sport management literature at the start of the 21st century where research focused on the results of being a sport fan (i.e., passion and aggression), rather than the formation of that fan identity (Jacobson, 2003). Notably, Branscombe and Wann (1991) posited an individual's connection to a favorite team "provides ties with the larger social structure and a sense of belongingness in a society that consists of fewer community and kin relationship ties" (p. 116).

However, social identity theory in sport management research fails to incorporate personal and preexisting traits related to value derived from being a member of a group. As such, Brown-Devlin and Devlin (2020) suggest team identification is more complicated than simply attributing it to social identity theory, as individualized attributes also drive sport team fandom. However, group affiliation has long been considered an influencer of personality traits (Crowley & Fan, 1997), so social identity theory should not be dismissed when assessing sport fandom. Research and practice should incorporate an "understanding of the power of group affiliation and its potential effects on individual behavior" (Brown-Devlin & Devlin, 2020, p. 382). For example, Platow et al. (1999) found group membership, through social identity theory, had a positive relationship with sport fans' charitable behavior at sporting events, specifically regarding monetary donations.

Social Identity Theory and Environmental Topics

Researchers have used social identity theory to interpret the influence social group memberships have on an individual's stance on environmental topics, a subject that blurs science and ideology. Hoffman (2015) writes, a socio-cultural approach to studying climate change is warranted, because social scientists view the wide rejection of scientific evidence, "not as a lack of adequate information but as the intentional or unintentional avoidance of that information" (p. 3). Fielding and Hornsey (2016) examined the ways in which social identities guide a person's attitudes and behaviors on climate change. Specifically, the researchers turned to intergroup conflict to address the polarizing nature of climate change information to opposing groups, citing intergroup tension as a way to reinforce ingroup characteristics (Fielding & Hornsey, 2016).

Social Identity Theory in Sport Ecology

Social identity theory has also served as a lens for examining fans' perceptions of team and team operations with respect to ES. For example, Smith (2009) demonstrated how a sport team's sustainable practices gives fans, and the community, an additional point of attachment from which their social identity with the team can grow. Sport management research has documented how the implementation of pro-environmental practices and initiatives can increase brand and fan identities (McCullough & Kellison, 2016), but not if personal attitudes prevent sport fans from engaging in those efforts. Additionally, positive linkages exist between highly identified sport fans (e.g., season ticket holders) and a sport team's environmental initiatives (Kellison & Cianfrone, 2017). A need also exists to examine sport fans' individual identities in the context of group settings. Hogg and Williams (2000) suggest inquiries into "large-scale collective phenomena," such as sport fandom, are underserved without also scrutinizing, "collective

representations of self and other, and of attitudes and behaviors (e.g., stereotypes and norms)” (p. 84).

Summary of Literature

Literature on climate change perceptions suggest social groups can inform a person’s climate change attitudes (Fielding & Hornsey, 2016). The overlapping nature of these identity-based theoretical principles further indicates the complexity of environmental issues and how innately personal they can be. Price et al. (2014) suggest elements of culture can explain opposing opinions on climate change understanding and perceptions. Examining sport fandom, as a culture, in tandem with values, beliefs, and norms can further explain climate change risk perceptions based on sport fandom.

Therefore, the hypotheses for the present study are:

H₁- Climate change skepticism will negatively influence MLB fans’ general climate change risk perceptions.

H₂- Increased climate change experiential processing will positively influence MLB fans’ general climate change risk perceptions.

H_{2a} – Generalized emotions will positively influence MLB fans’ general climate change risk perceptions.

H_{2b} – Personal experience will positively influence MLB fans’ general climate change risk perceptions.

H₃- Sport identification will moderate the relationship between MLB fans’ general climate change risk perceptions and their sport-specific climate change risk perceptions.

H4- Sport identification will moderate the relationship between MLB fans' sport-specific climate change risk perceptions and their willingness to adapt to climate change.

Social identity theory's applicability to environmental and sport concepts can help frame endeavors seeking to understand a person's normative influencers, ultimately guiding research on understanding how people come to know and believe in their worldviews. Stern (2000) suggests social influences on behavior could be a stronger predictor of a person's environmental behaviors than their individual attitudes. While theoretical support exists for integrating social identity theory and theories of environmentalism to frame pro-environmental behavior, researchers have yet to examine them in conjunction with sport-related environmental outcomes.

While this is a quickly growing area of research, sport management studies guided by VBN have not yet considered additional social and cultural drivers that may persuade or discourage sport fans' endorsement of pro-environmental behavior. Inoue (2015) identified a weakness of VBN theory is its "inability to take into account the effects of personal capabilities, social norms, and attitudes" better demonstrated by other theoretical frameworks (p. 24). The growing nature of this field, and the nature of environmental behavior as both deeply social and personal, necessitate the sociological framework approach of this study. Accordingly, the purpose of this study was to investigate relationships between team identification, team environmental initiatives, climate change attitudes, and perceptions of climate change risk for MLB teams. The results of this study aimed to provide empirical evidence for the UN Sport for Climate Action Framework's assumption that the harsh realities of climate change's impacts on

sport are not lost on sport fans, particularly in the sheltered United States. Additionally, perhaps the severity of climate change can be disseminated to the American public through sport, and additional gaps can be bridged between MLB fan's climate change cognitions and teams' ES initiatives.

CHAPTER III

METHOD

This chapter discusses the methodology to test the hypotheses for this study, including procedural details related to the research design, participants, sampling and data collection, instrumentation, and methods of data analysis.

Purpose of the Study

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. The results of this study provided communicable evidence to support the United Nations' Sport for Climate Action Framework (2018) at the spectator level where differences in sport identification helped explain relationships between MLB fans' climate change risk perceptions and willingness to adapt.

Hypotheses

The study tested the following hypotheses:

H₁- Climate change skepticism will negatively influence MLB fans' general climate change risk perceptions.

H₂- Increased climate change experiential processing will positively influence MLB fans' general climate change risk perceptions.

H_{2a} – Generalized emotions will positively influence MLB fans’ general climate change risk perceptions.

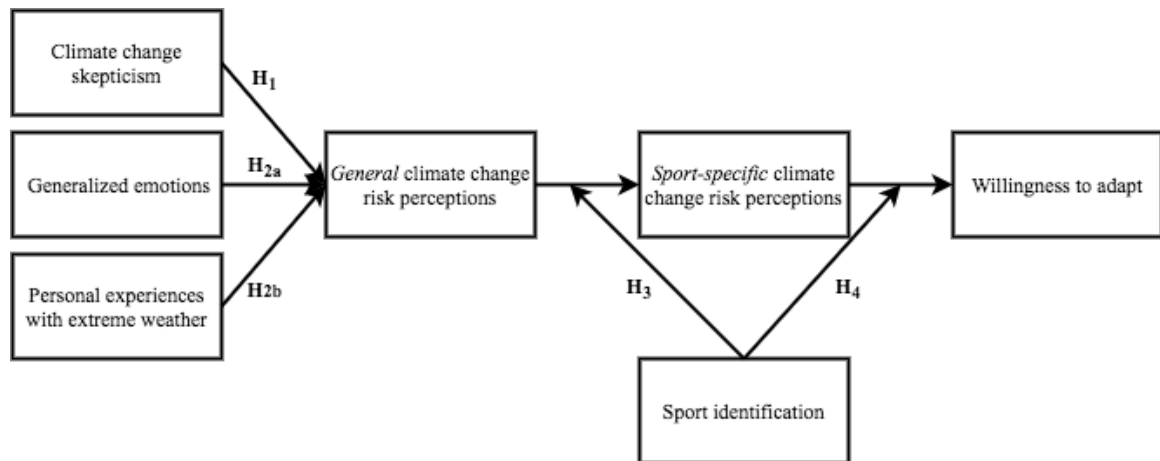
H_{2b} – Personal experience will positively influence MLB fans’ general climate change risk perceptions.

H₃- Sport identification will moderate the relationship between MLB fans’ general climate change risk perceptions and their sport-specific climate change risk perceptions.

H₄- Sport identification will moderate the relationship between MLB fans’ sport-specific climate change risk perceptions and their willingness to adapt to climate change.

Figure 1 (for reference only)

Conceptual and Theoretical Model



Study Context

Major League Baseball, the U.S.’s oldest major professional sport league, is particularly vulnerable to effects of climate change. The league’s geographic footprint, season duration, quantity of games, and predominantly outdoor playing spaces contribute to increasing climate exposure and subsequent risks. However, the demographic

composition of MLB fans matches that of those who are least likely to believe in climate change and support climate action in the U.S. Yet, fans represent an important group of stakeholders for the MLB, illustrating the value of understanding MLB fans' climate change attitudes, risk perceptions, and willingness to adapt. It is additionally valuable to discern the moderating effect of fandom on fans' sport-specific climate change risk perceptions and willingness to adapt. The interconnectedness between MLB and climate change makes U.S.-based MLB fans an appropriate population to address the aforementioned hypotheses.

Research Design

The present study utilized survey research for a quantitative analysis of U.S.-based MLB fans. Specifically, a cross-sectional survey design will be used to test the hypotheses above. Cross-sectional survey designs are advantageous as they record current attitudes and characteristics of a representative sample in a short amount of time (Creswell & Creswell, 2018; Dillman et al., 2014). Further, this type of survey design is both beneficial and appropriate for social science research as it examines present attitudes and perceptions relative to how an individual feels about an issue (Creswell, 2008).

Study Participants

The target population for this study were U.S. residents, at least 18 years of age, who self-identify as MLB fans. Previous research has established emotions, cognitions, and behaviors differ due to varying levels of sport identification (Wann & Branscombe, 1993). Research has also indicated an association between sport identification, spectatorship, and consumption behaviors (Kwon et al., 2007; Wann & Branscombe, 1993). As a result, this study's intention was not to focus solely on highly identified MLB

fans, but rather broadly examine a range of MLB fan identification for a comprehensive illustration of the role sport fandom plays in a person's sport-specific climate change risk perceptions and their willingness to adapt to climate risks faced by a sport they enjoy.

Sampling and Data Collection Procedure

This section discusses the sampling technique and data collection process. Because all MLB fans in the U.S. did not have an equal opportunity to participate in this survey, the researcher attempted to ensure the sample of participants was representative of the population of MLB fans in the U.S. This section outlines the procedural approach used to ensure generalizations on U.S.-based MLB fans can be made from the obtained sample.

Sampling Technique

A voluntary sampling technique was used to make inferences to the population of MLB fans for the present study (Creswell, 2008). Voluntary-response sampling, where respondents are solicited by the researcher to participate, is popular among researchers and is advantageous for the present study for a few reasons. First, while it is improbable to access and include the entire population of U.S.-based MLB fans, individuals who self-identity as an MLB fan were invited and encouraged to participate. Second, voluntary-response is a convenient, non-random sampling method. Individuals' election to participate increases the feasibility for the researcher to collect data and meet target population thresholds. Although a reasonable approach to reaching a representative sample, voluntary-response sampling is not without disadvantages. The self-selection nature of voluntary-response sampling lends itself to response bias. Response bias, which occurs because the researcher has limited control over who participates. The sample

composition of those who voluntarily respond could be entirely different from those who decided not to (Creswell, 2008). A skewed sample composition (e.g., only highly identified MLB fans choose to participate) would compromise the accuracy of data collection (Dillman et al., 2014). Additionally, coverage error, which occurs when the sample is unrepresentative of the target population, represents another disadvantage (Dillman et al., 2014). According to Dillman et al. (2014), this type of survey error is especially prevalent studies utilizing voluntary-response sampling.

Finally, there are associated risks with this sampling approach: measurement errors, response variance, and participant over-sampling. To avoid measurement errors, all survey items needed to be comprehensible and free of jargon for the general public. Confusing or overly complicated language discourages participation and jeopardizes both the sample size and response accuracy (Dillman et al., 2014). Avoiding response variance by providing clear instructions and asking unequivocal questions help mitigate this risk. Measurement item wording were reviewed for representativeness and clarity by a panel of expert reviewers and a field test, which are detailed in the instrument development section of this study. Additionally, there was a risk of over-sampling the highly engaged or strongly opinionated. Moore (1997) notes that the chances of this occurring increases when the survey topic is a controversial subject matter. Much like opinion-based studies on abortion (Ogland & Verona, 2011), gun control (O'Brien et al., 2013) and vaccinations (Kennedy et al., 2005), climate change attitude studies fall into this controversial realm. Studies on sensitive subjects should not be avoided because results have the opportunity to provide valuable insights and guidance for health and public policy decision-making. Data collection via Amazon's Mechanical Turk (MTurk) helped

mitigate these risks and provided some resolution to voluntary-response sampling's drawbacks. The benefits and advantages of utilizing MTurk are detailed in the next section on the present study's sampling method and procedure.

Sampling Method

The initial step for the data collection process was to identify an appropriate way to reach a representative sample of self-identifying MLB fans in the U.S. The sample was solicited through MTurk by seeking self-identifying MLB fans in the U.S., who selected a favorite MLB team. MTurk is a data crowdsourcing platform powered by Amazon, which allows researchers to affordably collect data from the diverse pool of MTurk workers. On the MTurk platform, the researcher (or "Requester") posts their instrument as a Human Intelligence Task (HIT) for MTurk Workers (or "Turkers") to complete for monetary compensation to be used on Amazon.com (Amazon MTurk, n.d.).

This recruitment method allowed the present study's sample to encompass a wide representation of geographic and demographic attributes. Paolacci et al. (2010) found MTurk to be a viable option for data collection in a large-scale, affordable manner. Particularly, the online labor market provides a reliable, cost-effective way for researchers to access participants, "while also reducing threats to internal validity" (Paolacci et al., 2010, p. 417). The use of MTurk for online participant recruitment has been found to be more representative than other forms of sampling, thereby improving the generalizability of study findings and addressing the risks in the previous section (Buhrmester et al., 2016). For example, because all participants are financially remunerated for their participation, the risk of over-sampling the highly engaged or strongly opinionated is mitigated. Another benefit of using MTurk for data collection was

its affordability for the researcher, as the cost for each completed HIT can be as low as \$0.01 (Amazon MTurk, n.d.; McInnis et al., 2016). The financial compensation for participation in MTurk HITs will help to alleviate sampling bias skewed toward more highly identified fans, and it also will help reduce under-sampling and participant dropout, as payment is only rendered for completed HITs.

MTurk is not without drawbacks, however. Berinsky et al. (2012) acknowledge while MTurk increases respondent diversity over in-person methods, MTurk users may not be the most representative in ethnic diversity, particularly regarding African American and Latino users. Compared to in-person convenience samples, Berinsky et al. (2012) found MTurk samples to be more representative of the U.S. population, overall, than more traditional sampling approaches. Being representative of the American population is particularly helpful for the present study because experimental research utilizing MTurk is gaining popularity in political science (Huber et al., 2012; Huff & Tingley, 2015) and social science (Chandler et al., 2014; Krupnikov & Levine, 2014) research, and the present study crosses these interdisciplinary bounds. In an analysis of MTurk Workers in the U.S., Huff and Tingley (2015) address some of the concerns regarding the external validity, and making generalizable inferences, based on the pool of available MTurk respondents. Huff and Tingley (2015) specifically found MTurk respondents were more likely to be White men, and that MTurk recruits more Hispanic men than African American, Asian, or Other. This determination, however, is not problematic for the present study given the demographics of MLB fans, outlined below in Table 1.

Table 1

MLB Interest Levels in the U.S. Demographics

	Avid fan	Casual fan	Not a fan at all
Gender			
Male	30%	31%	39%
Female	14%	26%	60%
Ethnicity			
White	23%	30%	47%
Hispanic	22%	26%	52%
African American	16%	22%	62%
Other	16%	27%	56%
Age Range			
18-34	15%	24%	61%
35-44	18%	35%	47%
45-64	23%	30%	47%
65+	31%	28%	41%

Source: Morning Consult (2020)

n = 2,201

However, MTurk workers tend to be younger in age and better educated yet make less in income than the working population of Americans (Pew Research Center, 2016a). The age discrepancy was also confirmed by Huff and Tingley (2015), finding the age composition of both male and female MTurk Workers across all ethnicities to skew toward younger adults. This directly conflicts with MLB's historically aging (Lombardo & Broughton, 2017) and generally wealthier (Harris Interactive, 2014) fanbase. Despite these shortcomings, MTurk provided a reliable way to reach potential participants beyond the use of a sample of college students or participants within the university community, which has been criticized in social and educational research (Chandler et al., 2019).

Creswell (2008) provides a study's sample should aim to represent the target population so results are generalizable. Results from the poll outlined in Table 2 will guide the appropriate representation needed for the present study. To mitigate the issue

that the acquired sample is unrepresentative to the target population, a chi-square goodness of fit was used ahead of data analysis to determine if the composition of the sample was demographically representative of MLB fans. A chi-square goodness of fit is a test done to confirm the representativeness of the sample to the target population by comparing the observed sample to the expected demographics of MLB fans in the U.S. The test confirms if variation in results is due to chance, or if an imbalance in variables exists. If significant differences existed between the demographic makeups of the sample and target population, the significant demographic variables will be used as control variables.

As of August, 2019, MLB was ranked the 2nd most popular men's professional U.S. league (Morning Consult, 2019). In 2019, the MLB also reported having a fanbase of 167.9 million people, the most in over two decades (Adler, 2019). Dillman et al. (2014) recommend a sample size minimum of $n = 278$ for a 95% confidence level when $N = 1,000$. Further, it is recommended to have a sample size of at least 200 cases to be appropriate for the model-fit indices used to interpret confirmatory factor analysis results (Kline, 2011). The 200-case minimum for CFA is the most stringent sample size requirement and will serve as the minimum rule of thumb for all analyses. However, because the total population of MLB fans greatly exceeds 1,000, an ideal sample size for the present study will be between 300 and 600 respondents. This sample size ceiling was set to maintain the 5% margin of error and for feasibility.

Data Collection Procedure

The questionnaire was designed online using a secure Qualtrics account on the researcher's password-protected computer. The questionnaire asked specific questions

related to each of the study's key variables to explore U.S.-based MLB fans' climate change attitudes (skepticism and experiential processing), general risk perceptions, sport-specific risk perceptions, and willingness to adapt. Administering the questionnaire online allowed survey distribution to reach larger quantities of people, thereby increasing the sample size within the target population, as well as increasing the speed of delivery for the researcher and completion for participants (Dillman et al., 2014).

The study's purpose, procedures, and questionnaires required approval from the Institutional Review Board (IRB) ahead of its distribution. Following IRB approval, the survey link to Qualtrics was made available on MTurk as a HIT, and the data collection process began. The questionnaire's preamble notified participants of the study's IRB approval, provided them with information outlining the study's purpose and their confidentiality, and obtained informed consent. Upon reading the preamble, participants could choose to proceed with the questionnaire or terminate their participation. Once the desired sample size was met ($n = 300-600$), and deemed appropriate to finalize data collection, the MTurk HIT closed, and data were be exported and saved into Microsoft Excel for accessibility and security, and IBM SPSS for data analysis.

Instrumentation

The questionnaire for this study contained seven sections, one to screen participants for inclusion and the remaining six sections to collect demographic information and responses regarding each of the study's key variables. Following the inclusion criteria, the first section determined the presence and amount of climate change skepticism adopted from Spence et al. (2011). The second section contained the experiential processing items adapted from van der Linden (2015). The third section

included general climate change risk perception items (van der Linden, 2015). The fourth section contained a sport identification scale, derived from the Point of Attachment Index (Robinson et al., 2004) to empirically determine participants' level of sport fandom. The fifth section consisted of sport-specific climate change risk perceptions as a modified subscale based on van der Linden (2015). The sixth section assessed MLB fans' willingness to adapt (WTA) to climate change based on Xie et al.'s (2019) Personal Willingness scale. The seventh, and final, section gathered data on the sample's demographic composition, including items on their political identification, which served as a covariate for each hypothesis. The full instrument can be found in Appendix A.

Inclusion and Exclusion Criteria

The questionnaire presented items to screen qualified participants for the study. To qualify for consideration in the study, potential subjects needed to meet the following inclusion criteria: (a) at or over the age of 18 years old, (b) is a resident of the United States, and (c) self-identify as a fan of an MLB team. For the study's sample to be comprised of adult, U.S.-based MLB fans, these screening questions asked participants to confirm their age and residency, and select the MLB team they are a fan of. Residency was further confirmed by asking participants to enter their residential zip code for demographic purposes only. All MLB teams were listed from a dropdown menu of options to reduce selection bias. Those who met the inclusion criteria proceeded to the next section, and the survey ended for all others. Likewise, an invalid or non-U.S. residential zip code disqualified a potential participant, and they were able to continue the questionnaire.

Climate Change Attitudes

Climate change attitudes were the first independent variables of interest in the present study. Two components of climate change attitudes were considered to test the stated hypotheses: climate change skepticism and experiential processing. Climate change skepticism and experiential processing have been explored in both comprehensive quantitative (Brownlee & Verbos, 2015; van der Linden, 2015; Whitmarsh, 2011) and in-depth qualitative (Carr et al., 2012; Otto-Banaszak et al., 2011) ways. For the purpose of the present study, a quantitative approach to measuring climate change attitudes is appropriate as it provides an opportunity for the researcher to gain a widespread understanding and determine how participants identified with each item asked. Further, the cross-sectional research design takes a snapshot of participants' stances at the time of surveying. This allowed the present study to be replicable for future research on other target populations or comparisons to be made over time for additional samples of MLB fans. Additionally, this approach is consistent with large-scale research on climate change attitudes in the U.S. (Leiserowitz et al., 2020; Pew Research Center, 2016b). These opportunities for research continuation are beneficial as climate change is a dynamic phenomenon, and polling data indicates public opinion has developed over time (Egan & Mullin, 2017).

Climate Change Skepticism

Climate change skepticism was determined via a 5-item scale adapted from Spence et al. (2011; $\alpha = .71$). Prior research often has relied on using a single item to measure skepticism, complicating researchers' needs to match a challenging subject matter with easily-understandable, yet comprehensive measures (Engels et al., 2013). Additionally, different forms of climate change skepticism have previously been

measured in isolation (Poortinga et al., 2011). The present study is specifically interested in the holistic relationships between climate change attitudes and risk perceptions for MLB fans, appropriating the use of multiple attitudinal statements for a single construct to measure skepticism. Each item was originally measured on a 5-point Likert scale, which has been adjusted to 7-points for measurement consistency and to increase variability in responses in the present study. Further, this scale adjustment is acceptable because mean scores are not being compared to previous research. The items are as follows (*1 = Strongly disagree* to *7 = Strongly agree* unless otherwise noted. Items will be reverse scored as necessary):

- Thinking about the causes of climate change, which, if any, of the following best describes your opinion? (*1 = Entirely natural processes* to *7 = Entirely human processes*; reverse-scored)
- I am uncertain that climate change is really happening
- The seriousness of climate is exaggerated
- Most scientists agree that humans are causing climate change (reverse-scored)
- It is uncertain what the effects of climate change will be

Adaptations of Spence et al.'s (2011) assessment of climate change skepticism have been widely cited in socio-psychological science (Capstick et al., 2015; van der Linden, 2015), further indicating the underlying mental models that shape a person's disposition toward climate change. This measure was selected for its conciseness and straightforward items, and higher scores correspond with greater climate change skepticism.

Experiential Processing

Experiential processing encompasses generalized emotions and personal experiences with extreme weather. These two measures of experiential processing of climate change were adapted from van der Linden (2015). Generalized emotions, or feelings about climate change, and personal experiences with climate harm (e.g., extreme weather) offer indirect and direct pathways to climate change risk perceptions respectively (van der Linden, 2015; Weber, 2006). Both generalized emotions and personal experiences with extreme weather served as independent variables in the first regression analysis detailed in the next chapter.

For generalized emotions, three items were adopted from van der Linden's (2015) Holistic Affect Scale, measured on a 7-point Likert scale (*1 = Very pleasant* to *7 = Very unpleasant* unless otherwise noted):

- I see climate change as something that is (1 = Very pleasant, 7 = Very unpleasant)
- Overall, I feel that climate change is (1 = Very favorable, 7 = Very unfavorable)
- To me, climate change is (1 = Very positive, 7 = Very negative)

To measure personal experience with extreme weather, a single item was used. The original personal experience with extreme weather scale contained two items measuring personal experience with flooding, and personal experience with all other extreme weather events. The present study did not isolate flooding for clarity, and due to geographic variations in the U.S. Additionally, the single-item will be adjusted to 7-points for consistency and variability, and likewise adjusted to a U.S. context rather than the United Kingdom. Further, the original measurement scale for personal experience with extreme weather from van der Linden (2015) utilized categorical data (e.g., *Never*,

Once, Twice, Can't remember), and the 7-point adjustment allowed continuous data to be used (*1 = Never, 7 = Frequently*):

- Considering roughly the last 5 years, how often (in total) have you personally experienced any type of *extreme weather event* in your local U.S. area? (e.g., flooding, severe heat waves, droughts, snowstorms, wildfires, hurricanes, blizzards)

Higher scores on these measures corresponded with stronger climate change experiential processing, positively influencing climate change risk perceptions. An empirical establishment of one's climate change experiential processing contribute to the formation of linkages made between sport fandom, perception of climate change risks, and willingness to adapt.

Climate Change Risk Perceptions

To measure MLB fans' general climate change risk perceptions, participants were asked to indicate their perceived concern, likelihood, and severity of climate impacts generally on society. Climate change risks create the possibility for uncertain global consequences (e.g., loss, damage, or destruction of property and life), and therefore should be assessed alongside a person's climate change attitudes. To do so, the present study adapted the four societal risk items from van der Linden's (2015) Risk Perception Index (RPI). Each of the items were measured on a 7-point Likert scale (*1 = Not serious at all* to *7 = Very serious*, unless otherwise noted):

- In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on our society? (*1 = Very unlikely* to *7 = Very likely*)

- How serious of a threat do you think that climate change is to the natural environment?
- How serious would you rate current impacts of climate change around the world?
- How serious would you estimate the impacts of climate change for the United States?

Sport-Specific Climate Change Risk Perceptions

Sport-specific climate change risk perceptions was the next variable of interest for the present study. To measure perceived sport-specific climate change risk perceptions, the previous societal RPI was modified for MLB fandom (van der Linden, 2015). These modifications included replacing the original subject matter of each item from the previous section (e.g., “the natural environment” in item 2) with a sport-specific subject matter for the present subscale (e.g., “Major League Baseball” in item 2). Doing so created distinct parallels between items on the general RPI and modified sport-specific RPI. Participants were then asked to indicate their perceived concern, likelihood, and severity of climate impacts on their MLB fandom. Considering the aforementioned definition of climate change risk, the present study defined sport-related climate change risk perceptions as a person’s belief that various climate change vulnerabilities and exposures may pose hazards to a specific sport. Adaptations to van der Linden’s (2015) RPI allowed participants to reflect on baseball-specific climate change risks, vulnerabilities (Orr, 2020), and exposures (Kellison & Orr, 2020). Likewise, all items were measured on a 7-point Likert scale (*1 = Not serious at all* to *7 = Very serious*, unless otherwise noted):

- In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on MLB? (*1 = Very unlikely to 7 = Very likely*)
- How serious of a threat do you think that climate change is to MLB?
- How serious would you rate current impacts of climate change on MLB?
- How serious would you estimate the impacts of climate change for [insert team]?

Willingness to Adapt

Ultimately, the present study sought to determine if sport identification moderated the relationship between sport specific climate change risks and MLB fans' willingness to adapt (WTA). Therefore, to measure MLB fans' WTA, the Personal Willingness scale ($\alpha = 0.89$) was adopted from Xie et al. (2019). This 6-item construct addresses both the substitution and WTP components of climate adaptation in terms of what an individual is willing to do, or pay for, to reduce climate risks. Each of the items were originally measured on a 4-point Likert scale (*1 = Not at all willing and 4 = Very willing*), but was adjusted to 7-points for measurement consistency and to increase variability in responses (*1 = Not at all willing and 7 = Very willing*):

- Pay more for fuel and use my vehicle less often
- Pay more for and use less electricity
- Pay a higher price for consumer goods from companies with good environmental records
- Buy more expensive electrical appliances that have better energy-efficient ratings rather than equivalent cheaper appliances
- Increase the number of times I use public transportation, walk or cycle each week

- Pay to offset the carbon emissions from my airplane flights to reduce carbon emissions

Sport Identification

Sport identification was the final subsection in the survey design, and was the moderator variable used to evaluate hypotheses 3 and 4. For the purpose of this study, sport fandom was operationalized by the extent to which an individual identifies with Major League Baseball. Measuring the degree of sport identification is a widely-used method of fan measurement in sport management research (Ahn et al., 2013; Park & Dittmore, 2014; Wann et al., 1999). Sport identification, like team identification, functions similarly to other social groupings (James & Trail, 2008; Murrell & Deitz, 1992).

The sport identification scale in previous sport consumer research has proven to be a reliable, and widely-used construct in determining team, event, and sport identification (James & Trail, 2008; Lock & Heere, 2017; Ross et al., 2009) and attachment (Robinson & Trail, 2005). Study participants were asked to complete the survey items referring to the MLB in section of the survey instrument. The original scale items were in reference to PGA and LPGA tours, e.g., “I consider myself to be a real fan of (the tour)” (Robinson et al., 2004). For the present study’s adaptation, this language was modified to be reflective of the MLB, rather than a single event, as listed below. Robinson et al.’s (2004) identification scale is comprised of three items measured on a 7-point Likert scale (*1 = Strongly disagree* to *7 = Strongly agree*):

- I consider myself to be a real fan of MLB
- I would experience a loss if I had to stop being an MLB fan

- Being an MLB fan is very important to me

Cronbach's alphas for this subscale have been reasonably strong in prior research ($\alpha = .75$ to $.88$; James & Trail, 2008; Kwon et al., 2007; Robinson & Trail, 2005; Trail et al., 2003), indicating good internal consistency for this scale. The present study used Cronbach's alphas to assess the reliability of all scale items as well as the hurdle value, 0.60-0.70 in exploratory research, to proceed with the data (van Griethuijsen et al., 2015).

Participant Demographics

The instrument concluded with demographic items to analyze background and descriptive information of the study's participants. Participants' gender, ethnicity, and birth year were used to establish representativeness of the target population. Additional items included participants' highest level of completed education, and household income. Political conservatism will serve as a control variable for each hypothesis, and is explained in greater detail in the next section. Demographics assured population segments were neither under-sampled nor over-sampled, and allowed for additional data comparisons to be made particularly as demographic information relates to a person's social identities.

Covariate

Previous research has established political identification as the single most significant influencer of climate change opinions for Americans (Ecklund et al., 2017; McCright & Dunlap, 2011a). Particularly, there is a historically negative correlation between political conservatism and climate change support (Armitage, 2005; Carrus et al., 2018; Gifford, 2011). Measuring political conservatism is beneficial for understanding differences in climate change attitudes and risk perceptions, and provides

shape to the climate change debate in the United States. Therefore, political conservatism served as the covariate for the present study. It was important to isolate climate change attitudes and perceptions of risk for sport fans from how they identify politically in order to reduce error variance. For the purpose of this study, political identification was measured in two ways: affiliation (nominal) and political conservatism (interval). For demographic categorization, participants were asked to choose which United States political party they most closely identify with from a list of options (Constitution, Democratic, Green, Libertarian, Republican). Then, participants were asked to identify how politically conservative they are on a 7-point Likert scale (1 = *Not at all politically conservative* to 7 = *Very politically conservative*), and this served as the basis of measurement for the covariate. Although 7-point Likert scales are technically an ordinal level of measurement (Wu & Leung, 2017), researchers suggest Likert scales of 7-points or greater can be measured on an interval level, and therefore represent continuous data (Norman, 2010). Quantifying political conservatism in addition to participants' self-selection of a political party allowed participants to further explain their political leaning beyond party affiliation.

Instrument Development

A series of pretests recommended by Dillman et al. (2014) were used to further develop and evaluate the survey instrument, and for quality control measures. The pretesting included: a) a panel of expert reviewers, and b) a field test. Dillman et al. (2014) also suggest conducting a pilot study as an additional pretest, however that measure of quality control is not necessary in the present study as the instrument was comprised of previously used reliable and validated scales. A multi-pronged pretest

procedure is suggested, as opposed to a single approach, for a more exhaustive assessment of the instrument (Dillman et al., 2014).

Panel of Experts

First, the panel of experts was comprised of sport management faculty members familiar with sport ecology and sport consumer research. The expert panel was provided with the study's purpose, research questions, and full instrument, and panelists were tasked with reviewing the questionnaire items for content validity. The panelists were asked to rate each item in the instrument for clarity and if the item measured the construct to which it belongs. Necessary modifications based on the panel's recommendations were made prior to the second pretest.

Field Test

Next, a field test was conducted with participants studying sport administration at the undergraduate, graduate and doctoral levels. Field test members were asked to confirm the instrument's clarity, readability, and understandability. Dillman et al. (2014) suggests the field test also serves as an opportunity for the researcher to examine varying approaches taken to complete the online questionnaire ahead of survey distribution. Variations can include survey feasibility on different internet browsers (e.g., Google Chrome, Safari, and Mozilla Firefox) and devices (e.g., desktop computers, laptops, tablets, and smartphones). Field test members were tasked with providing feedback related to any difficulties they faced with the instrument, including confusing items and unclear explanations. Any issues or difficulties that arise during the field test were addressed prior to survey distribution.

Data Analysis

This section details the data analysis approach for the present study, including factor analysis, to ensure strength and assess the structure of scale items. Statistical analyses were performed using the IBM Statistical Package for Social Sciences (SPSS) version 26 and SPSS AMOS software. Before proceeding with the data analysis, a confirmatory factor analysis (CFA) was conducted for each of the survey's subscales and is detailed below. Then, a series of three hierarchical multiple linear regressions served as the inferential statistical tests used to address the study's hypotheses. Statistical significance for all tests was determined at the Type I error rate of .05.

Confirmatory Factor Analysis

A confirmatory factor analyses (CFA) was conducted to determine convergent and discriminant validity of the measures used for each of the study's key variables. The CFA served as verification of the instrument's groupings, and determined if the item groupings correspond with the factors the instrument intends to measure. Thus, the CFA determined the utility of the subscales used for each of the present study's key variables. Further, a CFA was appropriate because each of the instrument's constructs is theoretically based (Tabachnik & Fidell, 2013). CFA is a form of structural equation modeling (SEM), and the following assumptions must be met prior to the analysis being performed. The model should have a theoretical foundation, normality must be assumed, and missing data and outliers should be removed (Pituch & Stevens, 2015).

First, Kline (2011) recommends using a chi-square to assess the overall model fit. However, Hooper et al. (2008) note that the chi-square statistic "is sensitive to sample size," meaning the statistic will lose power if the sample size is too small, and easily

reject the model ($p < .05$) if the sample size is too large (p. 54). To reduce reliance upon the chi-square statistic, McDonald and Ho (2002) as well as Hu and Bentler (1999) recommend also reporting the Comparative Fit Index (CFI), Normed-Fit Index (NFI), Tucker Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA) indices. Crowley and Fan (1997) suggest the necessity of multiple fit indices for a holistic view of the model. The CFI, NFI, and TLI have acceptable cutoff values between .90 and .95 for a good model fit, or between .95 and 1.00 for an excellent model fit (Bentler & Bonnet, 1980; Hu & Bentler, 1999; Kline, 2011). RMSEA values have a better fit the closer they are to zero, with a good fit being less than .07 and an excellent fit less than .03 (Hooper et al., 2008).

Hierarchical Multiple Linear Regressions

A series of hierarchical multiple linear regressions was used to assess the relationships between the key variables for each hypothesis in the model. Each individual analysis is detailed below. The goal of the hierarchical linear regression was to explain greater amounts of the relationship between variables, or variance, as the model becomes more specific. The hierarchical approach also means model specificity increases with the addition of variables into the model: demographic variables that are significantly different from the population, and the covariate, political conservatism.

Model Assumptions

There are several key assumptions that should be met when conducting a multiple linear regression to ensure the results are valid: independence of observations, a normally distributed dependent variable, linearity of the dependent variables, homoscedasticity of independent variables, and an absence of multicollinearity across independent variables

(Tabachnik & Fidell, 2013). As such, there are diagnostic tests to prevent any assumption violations. Once data is collected, the data will be further screened to ensure model completeness and that no additional violations took place.

To address the first assumption, independence of observations, the researcher must assure each participant only completed the survey once. This can be achieved either by checking MTurk workers' IP addresses, or by instituting a Qualification Type in Amazon MTurk's Application Programming Interface (API) to exclude MTurk workers who have previously completed the HIT. Normality will be assured by generating box-and-whisker plots and examining any skewness. To address the linearity assumption, a function of a true general linear model (GLM), scatterplots of the data will depict linear or nonlinear relationships. To address the third assumption, homoscedasticity of variances, a scatterplot of predicted and standardized residuals will illustrate an equal distribution across each of the predictor variables if the assumption is met.

Homoscedasticity of variances is of importance to determine there are no patterns in the dependent variable's variability across all independent variables (Tabachnik & Fidell, 2013).

Finally, prior to conducting the analysis, a Pearson product moment correlation will determine if multicollinearity exists between the independent variables. Should the correlation coefficient, r , exceed .70, the independent variables are too strongly associated and would be considered redundant. Having at least one redundant independent variable makes the independent variables not truly independent, thus compromising the researcher's ability to effectively interpret the results. The amount of redundancy can be assessed using the variance inflation factor (VIF). If the VIF value is

greater than 10, then multicollinearity exists, and one independent variable may need to be removed from the model (Osborne, 2017).

Regression Analysis

The hierarchical linear regression output provided several coefficients of interest across the model summary, ANOVA, and coefficients tables. The model summary table provided the R , R^2 , and adjusted R^2 values. The R value will depict the amount of correlation between the predicted and the observed values of the outcome variable. The R^2 value is of particular interest as it, for instance, depicts the amount of variance explained in general climate change risk perceptions by climate change skepticism and experiential processing. Finally, the adjusted R^2 value estimates the amount of variance attributed to chance to provide a more accurate depiction of the R^2 value attributable to the independent variables. The ANOVA table provided a model overview, another holistic view of total variance explained, where a p value below .05 for the F -statistic determined if the model itself is statistically significant. For example, a significant F -statistic suggests climate change skepticism and experiential processing are predictive of general climate change risk perceptions. The ANOVA results also provided verification that the aforementioned assumptions have been met.

To determine where the significance lies, and the differences occur in statistical significance based on the independent variables, the coefficients table were inspected. The unstandardized beta coefficients provide the significance and magnitude of the influence an individual predictor variable has on the outcome variable, regardless of its measurement scale. The standardized beta coefficient equates measurement scales across predictor variables, so comparisons could be made. The results from the earlier CFA

determined which beta coefficient is appropriate to explain climate change risk perceptions. Variables and goals for each inferential statistical analysis within this series of hierarchical multiple linear regressions are detailed in the following sections.

Hypotheses 1 and 2

The first hierarchical linear regression analysis in the series sought to determine the relationship climate change skepticism (H_1) and experiential processing of climate change (H_2) have with general climate change risk perceptions among U.S.-based MLB fans while controlling for political conservatism. Experiential processing was operationalized as generalized emotions (H_{2a}) and personal experiences with extreme weather (H_{2b}). Climate change skepticism, generalized emotions, and personal experiences with extreme weather served as the independent variables for this test, and be entered simultaneously into the model, as depicted in Figure 1. Participants' mean score for general climate change risk perceptions served as the dependent variable.

To proceed with the analysis, data were entered into the hierarchical model in block form. The first entry block contained the covariate, political conservatism, which has been shown to strongly influence climate change perceptions, to control for political differences in the sample. Following the control entry, scores for climate change skepticism, generalized emotions, and personal experiences were entered simultaneously as the second block. Entering the three IVs into the second block allowed the researcher to isolate the relationship between IVs and the outcome without the influence of political conservatism. The goal of this first regression analysis was to establish theoretical consistency with existing climate change attitude research and determine if climate change skepticism (X_1), generalized emotions (X_2) and personal experiences with

extreme weather (X_3) significantly influenced climate change risk perceptions (Y') for U.S.-based MLB fans, while controlling for political conservatism.

Hypothesis 3

The second hierarchical linear regression in the series sought to determine if, for U.S.-based MLB fans, sport identification moderated the relationship between general climate change risk perceptions and sport-specific climate change risk perceptions while controlling for political conservatism. General climate change risk perceptions (X_1) and sport identification (X_2) were the independent variables for this test, entered hierarchically into the model as blocks. Sport identification served as the moderator variable, to help explain differences in sport-specific climate change risk perceptions by degree of MLB fandom. Therefore, the moderator term depicted in the regression equation below tested an additional interaction between independent variables. Participants' mean score for sport-specific climate change risk perceptions served as the dependent variable (Y').

Hypothesis 4

The final hierarchical linear regression for the series sought to determine if, for U.S.-based MLB fans, sport identification moderated the relationship between sport-specific climate change risk perceptions and willingness to adapt to climate change risks, while controlling for political conservatism. The dependent variable from the previous analysis, sport-specific climate change risk perceptions (X_1) is now an independent variable as well as sport identification (X_2), the moderator variable. The dependent variable for this analysis was willingness to adapt (Y'). As in the previous analysis, sport identification served as a moderator variable.

CHAPTER IV

RESULTS

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. Specifically, this study sought to understand the influence of MLB fans' climate change attitudes on their general climate change risk perceptions, and the moderating role sport identification plays on their sport-specific climate change risk perceptions and willingness to adapt.

Instrument Pretesting

A series of pretests were conducted to determine the content and discriminant validities, reliability, as well as the clarity and structure of the instrument used in this study. This pretesting included: (a) a panel of experts, (b) a field test, and (c) a confirmatory factor analysis (CFA) to support the model's factor structure.

Panel of Experts

A panel of experts reviewed the study instrument for content validity and clarity. The panel included faculty members with expertise in sport consumer research, sport ecology, and climate change research. Each expert panelist received a spreadsheet of instrument items that contained the definition of each construct to be measured and the

citations from which each subscale was adopted. Panelists were asked individually to examine each item in terms of representativeness to the given definitions, and evaluate each item's clarity. Additionally, panelists were asked to provide any suggestions for minor changes and feedback.

The results of this pretest provided useful insight into ensuring the quality and clarity of the survey instrument. Most notably, the panel members recommended including a more exhaustive list of extreme weather events on the single-item measure of personal experiences with extreme weather (van der Linden, 2015). For the same item, the panel members recommended adjusting the 7-point scale from "Never" to "Always" to a more quantifiable scale.

Field Test

Adjustments according to the feedback from the panel of experts were made to the survey instrument ahead of the field test. The field test was conducted with doctoral students studying sport management and organizational behavior. Field test participants were provided the entire questionnaire hosted on Qualtrics.com. For the inclusion criteria question designed to reduce response bias, "Which of the following sport leagues do you consider yourself a fan of?" field test participants were advised to select Major League Baseball to proceed with the questionnaire.

For face validity, field test participants were asked to note their completion time, ease of use, readability, and understanding of the questions asked. Additionally, field test participants were encouraged to use a variety of web browsers and devices (e.g., smartphones and computers) to access the survey. Specifically, participants were provided a form that asked for feedback in the following regards: a) errors and

grammatical mistakes, b) unclear or confusing sections or wording, c) opportunities for improvement, and d) the identification of any errors or loopholes in the survey's logic conditions. Minor changes were made for clarity in the demographic section based on the field test results.

Descriptive Statistics

Sample Statistics

Data for the present study were collected via Amazon's Mechanical Turk (MTurk). The survey instrument was created and hosted on Qualtrics, with a direct link for MTurk workers to access the questionnaire as a Human Intelligence Task (HIT). Successful completion of the MTurk HIT awarded participants \$0.75. A total of 1,254 questionnaires were attempted, with 600 total HITs submitted successfully. Included in the 654 unsuccessful attempts were incomplete questionnaires, those that did not meet the study's inclusion criteria, failures to meet the captcha item, or failures to meet any of the questionnaire's bot detection questions (e.g., "Please select the color 'blue'") on Qualtrics. Of the 600 completed MTurk HITs, 40 were not considered finished or invalidated the HITs completion status, and were removed by the researcher. The remaining 560 completed questionnaires were reviewed by the researcher, resulting in the elimination of an additional 20 systematic response sets (e.g., a participant who responded "4" to every question). This data cleaning process resulted in a total of 540 useable responses for analysis, meeting the criteria for generalizability and exceeding the threshold for a CFA given the target population's size and a Type I error rate of .05 (Dillman et al., 2014).

Demographic Information

The sample of 540 participants was comprised of 339 men (62.8%) and 199 women (36.9%). A large majority of the sample reported being White (76.1%), followed distantly by Black or African-American at (14.4%). With respect to the sample's age, the majority of study participants were between 18 and 34 years old (35.56%). Exactly half of the study's sample (50.0%) indicated a 4-year college degree as their highest level of education, while 25.2% of participants have earned a master's degree or higher. In terms of household income, most study participants earn between \$50,000 and \$100,000 each year. Lastly, over half of the sample most closely identified with the Democratic Party (55.7%), followed by the Republican Party (29.8%). Table 2 depicts the full demographic data for the sample, as well as points of comparison for the target population from Table 1 in Chapter III.

Table 2

Demographics of U.S.-Based MLB Fans from Sample and Target Population

Variables	Sample		Target Population*
	<i>n</i>	<i>Frequency</i>	<i>Frequency</i>
Gender	540		
Male	339	62.78	60.95
Female	199	36.85	39.05
Other	2	0.37	--
Race	540		
White	411	76.11	78.93
Black	78	14.44	9.78
Hispanic/Latinx	27	5.00	17.39
Other	24	4.44	8.78
Age	540		
18-34	192	35.56	27.01
35-44	172	31.85	17.39

45-64	142	26.30	35.45
65+	34	6.30	20.15
Education	540		
< College degree	134	24.81	64.05
Bachelor's degree	281	52.04	22.66
≥ Post-grad	136	25.19	13.29
Household Income	540		
< \$50,000	178	32.96	45.99
\$50,000-100,000	263	48.70	34.95
> \$100,000	99	18.33	19.06
Political Party	540		
Republican	161	29.81	35.62
Democratic	301	55.74	36.87
Independent/Other	78	14.44	27.51

*Morning Consult (2020).

Chi-square goodness of fit tests determined if the demographic data of study participants were representative of the target population's key demographics, given the gender and racial composition of MLB fans. The results of the chi-square goodness of fit tests did not reveal statistically significant differences between the sample and target population in terms of gender ($\chi^2 = 0.72, p = .40$) or race ($\chi^2 = 2.52, p = .11$), indicating the present study's sample is representative of MLB fans for these primary variables. However, statistically significant differences ($p < .05$) exist between the sample and target population in terms of political party affiliation ($\chi^2 = 7.88, p = .005$) and age ($\chi^2 = 144.16, p < .001$).

The majority (55.7%) of study participants most closely identified with the Democratic Party, outpacing traditionally Republican affiliation across MLB consumers (Kamarck, 2018). While this finding is of interest, participants were asked to identify

their level of political conservatism in addition to their political party affiliation. Political conservatism, a continuous variable, will be used to account for increased variability across the present study's key variables (climate change attitudes, risk perceptions, and willingness to adapt) as a covariate. Additionally, a continuous measure of political conservatism helps understand additional differences between those who identified as politically independent or did not affiliate with a single political party.

Age, likewise, yielded a statistically significant chi-square statistic. The average age of Major League Baseball fans is 57 years according to Street and Smith's *Sport Business Journal* (Johnson, 2020). However, the average age for present study ($n = 540$) is 41.1 years. Alternatively, the average age of MTurk workers is slightly younger at 39.5 years, indicating the influence of an aging fan base on the present study (Pew Research Center, 2016a). The 2020 National Tracking Poll conducted by Morning Consult on sport fan demographics found the majority of casual MLB fans are between 45 and 64 years old, consistent with the average age. However, the age range with the most overall MLB fans is 35-44 years old (Morning Consult, 2020). Therefore, the effects of age will not be controlled for in the inferential analyses of the present study. Overall, the sample of MTurk workers presents to be representative of MLB fans, but information on the sample's MLB fandom will provide additional context for this study's results.

MLB Fandom Information

Once sample demographics were analyzed, responses specific to MLB fandom were assessed. As a screening method, all participants were asked to list which U.S. sport leagues they were a fan of from a dropdown menu of options. This served as a tool to ensure the study's integrity, as it required participants to select MLB to continue with the

survey. Participants were then asked to select their favorite MLB team, and provide their residential zip code. All 30 teams were represented in the sample with just one participant selecting the Toronto Blue Jays (0.2%), while a plurality of participants identified the New York Yankees (11.7%) as their favorite team.

Table 3 provides an overview of the sample's representation in terms of favorite MLB teams.

Table 3

Sample Participants' Favorite MLB Teams

MLB Team	Location	n	Percentage	In-State Fan Frequency
Arizona Diamondbacks	AZ	8	1.48	62.50
Atlanta Braves	GA	42	7.78	35.71
Baltimore Orioles	MD	11	2.04	54.55
Boston Red Sox	MA	41	7.59	9.76
Chicago Cubs	IL	43	7.96	69.77
Chicago White Sox	IL	17	3.15	29.71
Cincinnati Reds	OH	12	2.22	--
Cleveland Indians	OH	23	4.26	56.52
Colorado Rockies	CO	9	1.67	33.33
Detroit Tigers	MI	24	4.44	41.67
Houston Astros	TX	15	2.78	66.67
Kansas City Royals	MO	11	2.04	27.27
Los Angeles Angels	CA	17	3.15	35.29
Los Angeles Dodgers	CA	25	4.63	48.00
Miami Marlins	FL	7	1.3	42.86
Milwaukee Brewers	WI	10	1.85	50.00
Minnesota Twins	MN	8	1.48	50.00
New York Mets	NY	41	7.59	36.59
New York Yankees	NY	63	11.67	28.57
Oakland Athletics	CA	6	1.11	50.00
Philadelphia Phillies	PA	22	4.07	54.55
Pittsburgh Pirates	PA	14	2.59	85.71

San Diego Padres	CA	3	0.56	66.67
San Francisco Giants	CA	9	1.67	88.89
Seattle Mariners	WA	8	1.48	87.50
St. Louis Cardinals	MO	11	2.04	36.36
Tampa Bay Rays	FL	3	0.56	66.67
Texas Rangers	TX	21	3.89	57.14
Toronto Blue Jays	CAN	1	0.19	--
Washington Nationals	D.C.	15	2.78	--

N = 540

Table 3 shows that each of the 30 MLB teams were represented in the sample as at least one participant's favorite team. The in-state fan frequency column in Table X indicates the percentage of each team's fans who live in the team's state. Interestingly, half of all teams boast a primarily out-of-state fanbase, with 60.74% of the sample reporting being an out-of-state fan. This statistic is notable given the variety of potential climate vulnerabilities a person faces in their daily lives and those faced by MLB teams due to geographic location. With the exception of Ohio, states with multiple teams reported in-state fans for all teams. Table 4 provides additional context for the sample's fandom and geographic footprint.

Table 4

Sample Fandom and Geographic Footprint

Demographic	n	Frequency
League		
American League	269	49.81
National League	271	50.19
Residency		
In-State Fans	211	39.07
No In-State Team	150	27.78
Estimated games attended per season		
0 games	72	13.33

1-5 games	305	56.48
5-10 games	116	21.48
More than 10 games	37	6.85
Every game	9	1.67
<hr/>		
<i>N</i> = 540		

Overall, the sample's representativeness of MLB fans and geographic diversity were beneficial for the present study, particularly given the sample primarily consisting of individuals who regularly attend games (86.76%). Although the sample skews slightly younger and more democratic than the target population, the sample's majority (60.74%) reported being an out-of-state fan, with 150 participants residing in a state without an MLB team. With the exception of Washington, D.C., the four unrepresented states of residency in the sample were Mississippi, Montana, New Hampshire, and Wyoming, none of which are home to an MLB team.

Confirmatory Factor Analysis

The items used to measure climate change skepticism, generalized emotions, personal experiences with extreme weather, general risk perceptions, willingness to adapt, and sport identification have been used in previous research (Robinson et al., 2004; Spence et al., 2011; van der Linden, 2016; Xie et al., 2019). While new subscales were not developed for the present study, the items measuring sport-specific climate change risk perceptions were adapted from the general climate change risk perceptions scale (van der Linden, 2015). To confirm construct validity of a multi-factor instrument, a confirmatory factor analysis (CFA) was conducted. The CFA serves to support the structure of factors contributing to a given latent variable, that is, each of the study's key variables. Because theoretical support exists for the item groupings, a CFA is appropriate to confirm the factor structure and establish construct validity.

Performed on SPSS 27 AMOS, the CFA consisted of six latent variables measuring climate change skepticism, generalized emotions, general risk perceptions, sport-specific risk perceptions, willingness to adapt, and sport identification. Personal experiences with extreme weather, a key climate change attitude variable, was excluded from the CFA as it was measured with a single-item. Creating a latent variable based on a single indicator is unnecessary when performing a CFA, as it complicates model identification (IBM Support, 2018). For personal experiences with extreme weather, the observed variable will be used in the inferential analysis.

The sample size of 540 exceeds the CFA assumption ($n = 200$), but is appropriate for the factor analysis which consisted of 25 observed variables spread over the six latent variables in the model (Suhr, 2006). Outliers and missing data were addressed prior to performing the CFA. Five measures of model fit were used to analyze CFA results: chi-square, comparative fit index (CFI), normed-fit index (NFI), Tucker Lewis Index (TLI), and the root mean square error of approximation (RMSEA) index. Results of the first CFA revealed inadequate model fit between the observed data and the hypothesized models, producing unacceptable values for each of the 5 model fit indices according to Hu and Bentler (1999). An examination of the factor loadings revealed the first item on the climate change skepticism subscale (“Thinking about the causes of climate change, which of the following best describes your opinion? Climate change is caused by...”) fell below the .5 threshold for factor loadings suggested by Chen and Tsai (2007) and was removed from the model. Further inspection found high modification indices for four pairs of error variances. To remedy this, covariances were drawn between the pairs of error variances. The CFA was retested and estimated residuals were examined to

determine additional model discrepancies. The model fit, upon retesting, contained 24 observed variables for the six latent variables. Table 5 details the model fit summary for the CFA.

Table 5

Confirmatory Factor Analysis Model Fit Summary

Model Fit Index	Present Study	Model Fit Standard
Chi-square (p)	.00	> .05
CFI	.95*	> .95 ^a
NFI	.93*	> .90 ^a
TLI	.94*	> .90 ^a
RMSEA	.068*	< .07 ^b

*Indicates the model fit standard was met

^aHu & Bentler (1999)

^bHooper et al. (2008)

While the analysis indicates a significant chi-square statistic ($\chi^2 = 813.47, p < .001$), indicating a poor model fit, the sample size ($n = 540$) must be taken into consideration. In fact, Hooper et al. (2008) recommend reporting multiple model fit indices as the chi-square analysis will likely reject model fit for large sample sizes. Overall results of the CFA indicate good convergent and discriminant validity as the latent variables are theoretically related, but distinct from one another. Factor loadings (β) for each of the six latent variables' items provide evidence for convergent validity. Awang et al. (2015) suggest good factor loadings fall above .50, and excellent factor loading fall above .70. Good and excellent factor loadings for this study range from .64 (Climate change skepticism item #4) to .94 (Sport identification item #3) as shown in Table 6. One item's factor loading fell below the .50 threshold (Climate change skepticism #3) at .40. Although acceptable, Awang et al. (2015) note the convergent

validity standard for is for well-developed constructs, indicating additional reliability tests may be needed in future research for the Skepticism Scale developed by Spence et al. (2011) to support the theoretical underpinning and understanding of climate change skepticism.

Table 6

Scale Items, Standardized Factor Loadings, Cronbach's Alphas, Means, and Average Variance Extracted

Factor and Item	β	α	M	AVE
Climate Change Skepticism		.76	3.45	.45
I am uncertain that climate change is really happening.	.72			
The seriousness of climate change is exaggerated.	.92			
Most scientists agree that humans are causing climate change.	.40			
It is uncertain what the effects of climate change will be.	.64			
Generalized Emotions		.94	5.23	.63
I see climate change as something that is (Very pleasant...)	.92			
Overall, I feel that climate change is (Very favorable...)	.91			
To me, climate change is (Very positive)	.91			
General Climate Change Risk Perceptions		.94	5.36	.47
In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on our society?	.87			
How serious of a threat do you think that climate change is to the natural environment?	.89			
How serious would you rate the current impacts of climate change around the world?	.90			
How serious would you estimate the impacts of climate change for the United States?	.90			
Sport-Specific Climate Change Risk Perceptions		.95	4.31	.68
In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on Major League Baseball?	.89			
How serious of a threat do you think that climate change is to Major League Baseball?	.93			
How serious would you rate current impacts of climate change on Major League Baseball?	.90			

How serious would you estimate the impacts of climate change for the [team name]?	.93			
Willingness to Adapt	.92	4.22	.63	
Pay more for fuel and use my vehicle less often.	.83			
Pay more for fuel and use less electricity.	.87			
Pay a higher price for consumer goods from companies with good environmental records.	.87			
Buy more expensive electrical appliances that have better energy-efficient ratings rather than equivalent cheaper appliances.	.73			
Increase the number of times I use public transportation, walk, or cycle each week.	.74			
Pay an additional fee to offset the carbon emissions from my airplane flights to reduce carbon emissions.	.84			
Sport Identification	.81	3.24	.85	
I consider myself to be a real fan of MLB.	.89			
I would experience a loss if I had to stop being an MLB fan.	.86			
Being an MLB fan is very important to me.	.94			

Upon establishing the factor structure and convergent validity, the model was checked for discriminant validity. Discriminant validity determines the degree to which latent variables are measuring different things, thereby avoiding multicollinearity. Therefore, a latent variable should not be highly correlated with any other latent variables. If the correlation value between latent variables exceeds an absolute value of .85, they are considered redundant and difficult to distinguish from one another (Voorhees et al., 2015). Table 7 depicts these correlation estimates for the latent variables included in the CFA, all falling within the acceptable range, thus avoiding discriminant validity concerns.

Table 7

Correlation Estimates Between Variables

Factor	Factor	Correlation Estimate
Skepticism	↔ Generalized Emotions	-.66

Skepticism	↔	General Risk Perceptions	-.57
Skepticism	↔	Sport-Specific Risk Perceptions	-.12
Skepticism	↔	Willingness to Adapt	-.09
Skepticism	↔	Sport Identification	.16
Generalized Emotions	↔	General Risk Perceptions	.51
Generalized Emotions	↔	Sport-Specific Risk Perceptions	.01
Generalized Emotions	↔	Willingness to Adapt	.02
Generalized Emotions	↔	Sport Identification	-.03
General Risk Perceptions	↔	Sport-Specific Risk Perceptions	.61
General Risk Perceptions	↔	Willingness to Adapt	.57
General Risk Perceptions	↔	Sport Identification	-.07
Sport-Specific Risk Perceptions	↔	Willingness to Adapt	.74
Sport-Specific Risk Perceptions	↔	Sport Identification	.09
Willingness to Adapt	↔	Sport Identification	.06

Considerably low factor correlations were found in the overall model. However, the factors in these pairings (e.g., generalized emotions and sport-specific risk perceptions) are not directly measured in this study's hypotheses. In fact, the factor correlations between factors for each hypothesis are not close to 0, but adhere to the absolute value range of below .85 (.51 - .74). Likewise, low, but acceptable construct reliabilities were present for two subscales (.45 and .47). Because these AVE values from Table 6 are below the minimum threshold of .50, suggesting less than half of the variance is explained, additional steps were taken to ensure construct reliability. Bollen, (1989) advises considering the number of items per latent variable affect AVE, noting low item-to-factor ratios may yield low AVE values. In fact, Cronbach & Shavelson (2004) suggest using multiple indicators to assess construct reliability, particularly given the population and context of the research. As a safeguard for construct reliability, the

composite reliability values for each latent variable were calculated and reported below in Table 8.

Table 8

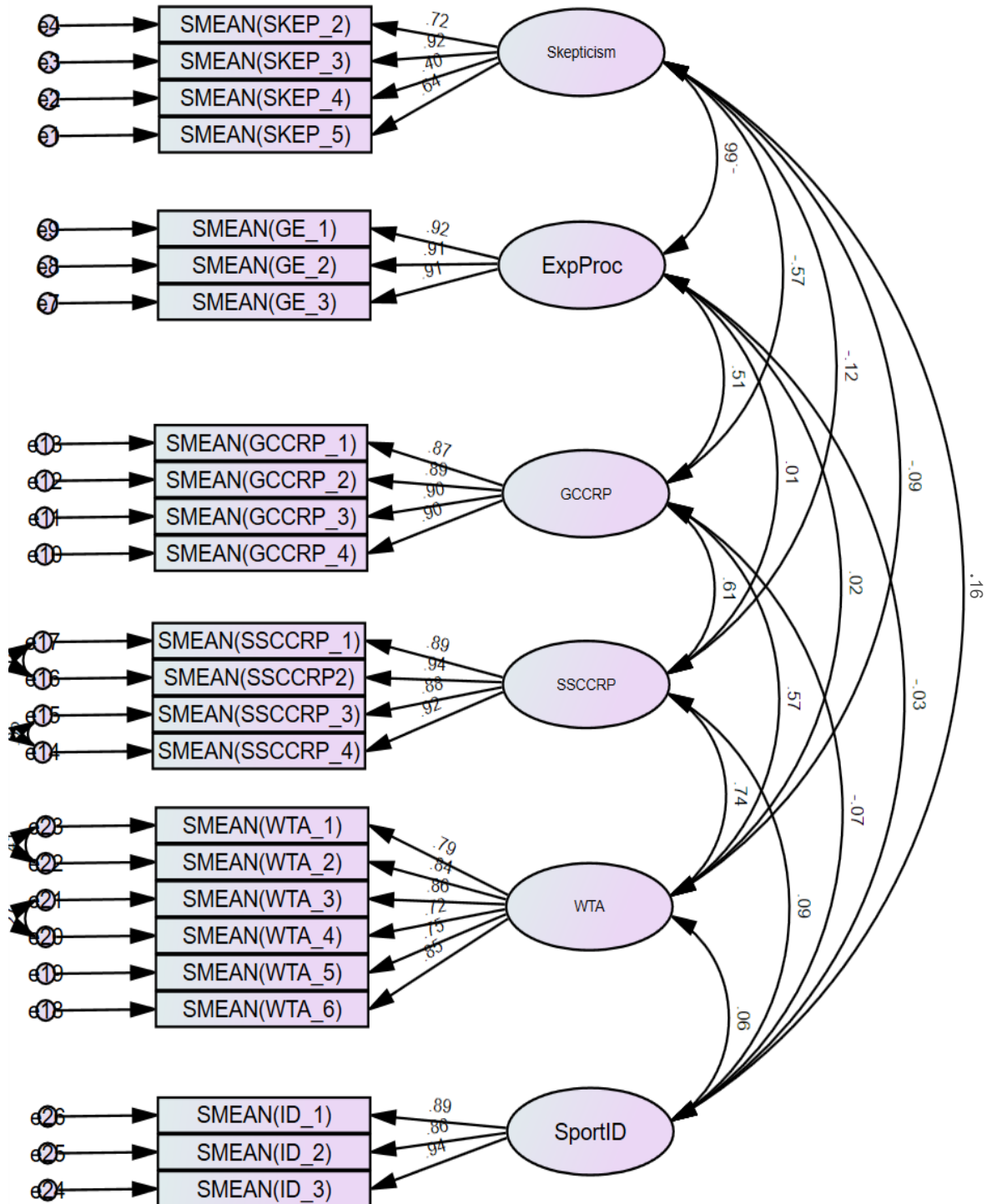
Factor Composite Reliability Scores

Factor	Composite Reliability
Skepticism	.70
Generalized Emotions	.84
General Risk Perceptions	.78
Sport-Specific Risk Perceptions	.89
Willingness to Adapt	.91
Sport Identification	.95

Composite reliability scores, like Cronbach's alpha, measure internal consistency, and can confirm constructs are reliable with a value greater than or equal to .7 (Farrell & Rudd, 2009). Through an examination of composite reliability values, all 6 factors of the CFA meet the reliability threshold. Ultimately, the data collected were found to be a good fit for the model through the CFA, shown in Figure 2.

Figure 2

Confirmatory Factor Analysis



Summary of Instrument Pretesting, Sample Statistics, and Factor Analysis

As a result of the pretests and factor analysis, the present study met acceptable standards for content validity, face validity, and instrument reliability. Modifications to the instrument yielded an appropriate overall model to test the hypotheses in the present study. The data collection process yielded a sample consistent with the population of MTurk, yet representative of MLB fans with the exception of age and political party affiliation. Participants in the sample identify as fans of all 30 MLB teams, represent 46 U.S. states, and range in age from 19 to 80 years old. Low, but acceptable construct reliabilities were found for two subscales below the minimum threshold, and low correlations between some latent variables were present. However, correlation estimates between dependent latent variables of interest and composite reliability for all latent variables in the present study were deemed appropriate, thus avoiding redundancy, and acceptable for continued analysis.

Data Analysis

This study used a series of three hierarchical multiple linear regressions to test the following hypotheses:

H₁- Climate change skepticism will negatively influence MLB fans' general climate change risk perceptions.

H₂- Increased climate change experiential processing will positively influence MLB fans' general climate change risk perceptions.

H_{2a} – Generalized emotions will positively influence MLB fans' general climate change risk perceptions.

H_{2b} – Personal experience will positively influence MLB fans’ general climate change risk perceptions.

H₃- Sport identification will moderate the relationship between MLB fans’ general climate change risk perceptions and their sport-specific climate change risk perceptions.

H₄- Sport identification will moderate the relationship between MLB fans’ sport-specific climate change risk perceptions and their willingness to adapt to climate change.

The following sections report the assumptions of hierarchical multiple linear regressions, overall descriptive statistics, and the results of each inferential analysis.

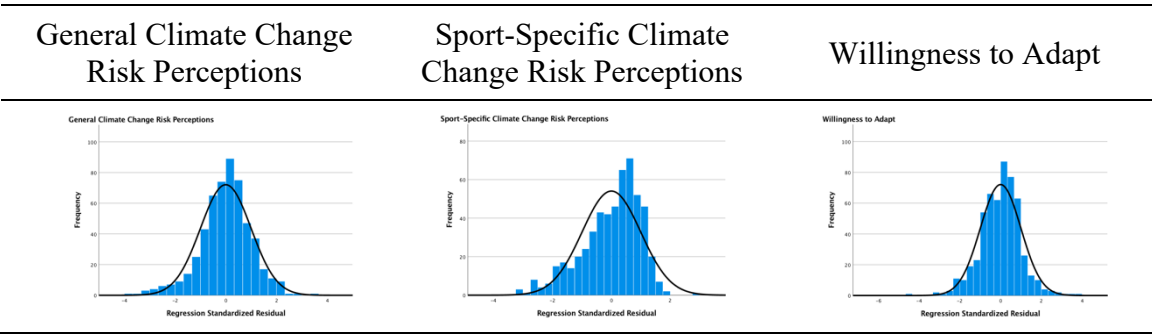
Assumptions of Hierarchical Multiple Linear Regressions

There are five main assumptions that must be met in order to perform and successfully interpret a multiple linear regression. These assumptions are consistent for hierarchical multiple linear regressions as well: independence of observations, normal distribution of dependent variables, linearity of the dependent variables, homoscedasticity of independent variables, and an absence of multicollinearity across independent variables. The online cross-sectional survey design allowed for two safeguards for independence of observations. First, IP address checks embedded within the Qualtrics software system prevents multiple survey attempts from the same IP address. Second, Amazon MTurk workers can only complete each HIT once per MTurk ID, preventing repeat attempts. Further, duplicated MTurk IDs were checked manually for each attempt that was approved for compensation. To determine if the dependent variables in the present study are normally distributed, response frequencies were plotted on histograms.

Figure 3 depicts these plots for an indication of skewness across the data. These frequency histograms illustrate skewness solely for sport-specific climate change risk perceptions, indicating the normality assumption is potentially violated. However, larger sample sizes influence the regression’s robustness (Stevens & Taylor, 2009). When an appropriate, but large, sample size is analyzed in a regression analysis, Schmidt and Finan (2018) suggest the normality assumption typically does not affect results, therefore analysis of data continued.

Figure 3

Histograms of the Dependent Variables

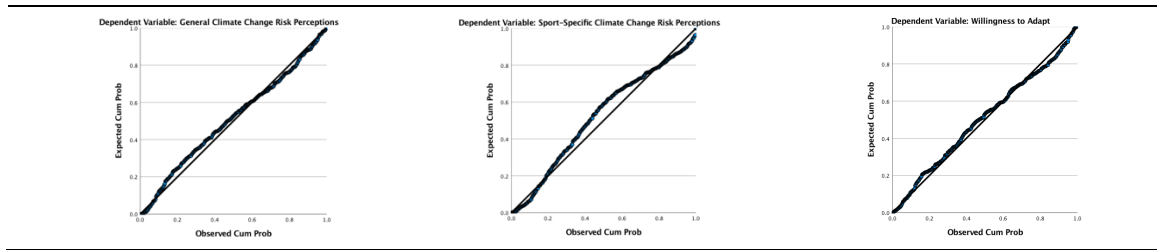


Upon meeting these first two assumptions, probability plots (P-Plot) of standardized residuals were generated to check the linearity of dependent variables. Meeting this assumption is determined by the proximity of plotted residuals to the solid least-squares regression line depicted in Figure 4.

Figure 4

Probability Plots of Regression Standardized Residuals





Linearity is met as the residuals illustrate a linear relationship between the independent variables and each of the dependent variables, so the next assumption of homoscedasticity of independent variables can be checked. Generated scatterplots of the studentized residual and unstandardized predicted value for each of regression analysis were analyzed for conical patterns. Conical, or cone-shaped, patterns indicate the presence of heteroscedasticity of independent variables. No such patterns were found. Finally, the data were examined for an absence of multicollinearity across independent variables. In order to successfully determine which independent variables predict changes in the dependent variables, multicollinearity should be avoided. To establish the absences of multicollinearity, the Variance Inflation Factors (VIF) for each independent variable were assessed and listed below in Table 9.

Table 9

Variance Inflation Factors (VIF) of the Independent Variables

	Independent Variable	VIF
H1	Climate change skepticism	2.00
	Political conservatism*	1.00
H2	Generalized emotions	1.61
	Personal experiences with extreme weather	1.06
	Political conservatism*	1.46
H3	General climate change risk perceptions	1.12
	Sport identification	1.01
	Political conservatism*	1.13
H4	Sport-specific climate change risk perceptions	1.02

Sport identification	1.02
Political conservatism*	1.02

*Denotes covariate

The lower threshold for multicollinearity is a VIF value exceeding 4.0, suggesting no multicollinearity issues were present and permitting the continuation of data analysis (Midi & Bagheri, 2010; O'Brien, 2007).

Descriptive Statistics

After meeting the assumption criteria for hierarchical multiple linear regressions, descriptive statistics were inspected for each key variable. Personal experiences with extreme weather and political conservatism, the covariate for this study, are single-item measures that were excluded from the CFA. The mean, standard deviation (SD), median, and range for each independent and dependent variable are presented in Table 10.

Table 10

Descriptive Statistics for Independent and Dependent Variables

Item	M	SD	Median	Range
Political Conservatism	3.97	1.84	4.00	6.00
Skepticism	3.45	1.36	3.75	5.50
Generalized Emotions	5.29	1.48	5.66	5.67
Personal Experiences	4.05	1.63	4.00	6.00
General Risk Perceptions	5.36	1.30	5.50	6.00
Sport-Specific Risk Perceptions	4.31	1.55	4.50	6.00
Willingness to Adapt	4.22	1.55	4.50	6.00
Sport Identification	3.24	1.61	3.00	6.00

N = 540

Upon examining the descriptive data, overall mean scores appear appropriate for 7-point Likert scales. Additionally, participants scored on the full range (6) for every variable except generalized emotions (5.67). Overall, most scale means are close to the

scale medians. Scale medians range from 3.75 to 5.66. Median scores at, or close, to 4.00 indicate favorable midpoint scores for participants. The mean score for sport identification ($M = 3.24$) indicates lower overall identification with MLB, which will be discussed further in the next chapter given the demographic and geographic diversity of the study's sample.

Hierarchical Multiple Linear Regression 1

The first in the series of three hierarchical multiple linear regressions tested hypotheses 1 and 2. These first two hypotheses seek to discern the influence of climate change attitudes on MLB fans' general climate change skepticism. The two prominent attitudinal factors of interest are climate change skepticism (H_1) and experiential processing (H_2). Further, experiential processing is categorized into generalized emotions (H_{2a}), a sensory response, and personal experiences with extreme weather (H_{2b}), a bodily response.

To test the first and second hypotheses, the first hierarchical multiple linear regression explained which climate change attitudes influenced general climate change risk perceptions for MLB fans while controlling for political conservatism. Scale mean for general climate change risk perceptions were calculated as participants' average GCCRP scale scores. Political conservatism was entered into the regression model as a covariate to minimize its influence for subsequent predictors (block 1). Political conservatism, explained a statistically significant amount of variance, $R^2 = .105$, $F(1, 538) = 63.41$, $p < .001$. Thus, the covariate indicated 10.5% of variance in general climate change risk perceptions is attributed to political conservatism. Each of the climate change attitudes were added to the equation in block 2. Overall, the addition of climate

change attitudes significantly predicted general climate change risk perceptions ($\Delta R^2 = .378$, $F(4, 535) = 125.39$, $p < .001$). The results of each hypothesis are below, followed by the output summary for the hierarchical multiple linear regression in Table 11.

Results for Hypothesis 1

H₁- Climate change skepticism will negatively influence MLB fans' general climate change risk perceptions.

The addition of climate change skepticism to the model in block 2 significantly contributed to the prediction of general climate change risk perceptions by the three climate change attitudes ($B = -0.42$, $p < .001$). Although climate change skepticism does significantly predict general climate change risk perceptions, H_1 suggests skepticism should do so negatively. Because the continuous variables are measured on the same scale, the unstandardized coefficient (B) can be interpreted to distinguish the direction of prediction. Upon examining climate change skepticism's unstandardized coefficient, H_1 is supported.

Results for Hypothesis 2

H₂- Increased climate change experiential processing will positively influence MLB fans' general climate change risk perceptions.

Hypothesis 2 adds experiential processing into the first regression equation of attitudes predicting general climate change risk perceptions. Experiential processing consists of generalized emotions and personal experiences with extreme weather as sensory and bodily attitudes, respectively. Unlike skepticism, the second hypothesis predicts experiential processing will positively influence MLB fans' general climate change risk perceptions. Like skepticism, both measures of experiential processing were

added in block 2 of the first regression equation. Generalized emotions and personal experiences with extreme weather significantly added to the overall prediction of general climate change risk perceptions.

Results for Hypothesis 2a.

H_{2a} – Generalized emotions will positively influence MLB fans’ general climate change risk perceptions.

To test hypothesis 2a, the scale mean for generalized emotions was added into the overall regression equation in block 2. It was hypothesized that the independent variables in hypothesis 2 would be positive predictors of MLB fans’ climate change risk perceptions. Upon examining the unstandardized coefficient, H_{2a} is supported ($B = 0.22$, $p < .001$).

Results for Hypothesis 2b.

H_{2b} – Personal experience will positively influence MLB fans’ general climate change risk perceptions.

To test hypothesis 2b, the scale mean for personal experiences with extreme weather was also added into block 2 of the regression equation. Like generalized emotions, personal experiences explained a statistically significant amount of variance in general climate change risk perceptions, ($B = 0.33$, $p < .001$). As with the previous analysis of generalized emotions, personal experiences were hypothesized to positively predict MLB fans’ climate change risk perceptions. From examining the unstandardized coefficient, H_{2b} is also supported.

Table 11

Results of Hierarchical Multiple Linear Regression for General Climate Change Risk Perceptions

	Measurement	Coefficients			<i>p</i>	<i>F</i>	<i>R</i> ²	ΔR^2	<i>sr</i> ²
		<i>B</i>	<i>S.E.</i>	β					
1	--	--	--	--	--	63.41**	.105	--	--
	(Constant)	6.27	.13	--	.00	--	--	--	--
	Pol. Conservatism**	-0.23	.03	-0.33	.00	--	--	--	-.33
2	--	--	--	--	--	125.39**	.484	.378	--
	(Constant)	4.51	.30	--	.00	--	--	--	--
	Pol. Conservatism	-0.05	.03	-.06	.09	--	--	--	-.07
	Skepticism**	-0.42	.04	-.44	.00	--	--	--	-.40
	Gen. Emotions**	0.22	.04	.25	.00	--	--	--	.27
	Personal Exp.**	0.33	.03	.41	.00	--	--	--	.48

* Indicates significance at the $p < .05$ level

** Indicates significance at the $p < .01$ level

Results of the first hierarchical multiple linear regression indicate that, while controlling for political conservatism, climate change skepticism is a strong negative influencer of MLB fans' climate change risk perceptions, consistent with the literature. Additionally, personal experiences with extreme weather was a strong positive predictor of general climate change risk perceptions. Each independent variable of interest in the first analysis significantly predicted the outcome variable.

Hierarchical Multiple Linear Regression 2

To test the third hypothesis, a second hierarchical multiple linear regression explained if general climate change risk perceptions predict sport-specific climate change risk perceptions while controlling for political conservatism. Additionally, H₃ sought to determine if that relationship was moderated by sport identification. Scale means for sport-specific climate change risk perceptions, calculated as participants' average sport-specific CCRP scale scores served as the dependent variable. Again, political conservatism was entered into the regression model as a covariate to minimize its

influence the predictor and moderator term (block 1). General climate change risk perceptions and the scale mean for sport identification were entered in the second block, and the moderator term was added in the third block. Overall, the addition of variables significantly predicted general climate change risk perceptions ($\Delta R^2 = .001$, $F(2, 536) = 137.22$, $p < .001$). The specific relationships in hypothesis 3 are discussed below.

Results for Hypothesis 3

H₃- Sport identification will moderate the relationship between MLB fans' general climate change risk perceptions and their sport-specific climate change risk perceptions.

Like in the first analysis, political conservatism, explained a statistically significant amount of variance in sport-specific climate change risk perceptions, $R^2 = .008$, $F(1, 538) = 4.21$, $p = .04$. Thus, political conservatism explained 0.08% of variance in sport-specific climate change risk perception. While the second block indicates sport identification does predict sport-specific climate change risk perceptions, the moderator term (Gen. CCRPxSport ID) was not statistically significant, ($B = -0.05$, $p = .38$). The moderating relationship between general and sport-specific climate change risk perceptions was of particular interest for hypothesis 3. It is worth noting the main effects for this block 3, where general climate change risk perceptions ($B = 0.72$, $p < .001$) and sport identification ($B = 0.14$, $p < .001$) were both statistically significant. These details and the results of the second hierarchical regression are shown in Table 12. Despite the strong influence general climate change risk perceptions have on sport-specific ones, the relationship is not moderated by sport identification, thus H₃ is not supported.

Table 12

Results of Hierarchical Multiple Linear Regression for Sport-Specific Climate Change Risk Perceptions

	Measurement	Coefficients			<i>p</i>	<i>F</i>	<i>R</i> ²	ΔR^2
		<i>B</i>	<i>S.E.</i>	β				
1	--	--	--	--	--	4.21*	.008	--
	(Constant)	4.61	.16	--	.00	--	--	--
	Pol. Conservativism*	-0.07	.04	-.09	.04	--	--	--
2	--	--	--	--	--	137.22**	.344	.336
	(Constant)	-0.28	.33	--	.39	--	--	--
	Pol. Conservativism*	0.08	.03	.09	.01	--	--	--
	General CCRP**	0.72	.04	.60	.00	--	--	--
	Sport ID**	0.13	.03	.14	.00	--	--	--
3	--	--	--	--	--	.77	.345	.001
	(Constant)	-0.30	.33	--	.35	--	--	--
	Pol. Conservativism*	0.08	.03	.10	.01	--	--	--
	General CCRP**	0.72	.04	.60	.00	--	--	--
	Sport ID**	0.14	.04	.14	.00	--	--	--
	Gen. CCRPxSport ID	-0.05	.06	-.03	.38	--	--	--

* Indicates significance at the $p < .05$ level

** Indicates significance at the $p < .01$ level

Results of the second hierarchical multiple linear regression suggest, when controlling for political conservatism, both general climate change risk perceptions and sport identification predicted sport-specific climate change risk perceptions. However, sport identification does not moderate the relationship between general and sport-specific climate change risk perceptions.

Hierarchical Multiple Linear Regression 3

To test the fourth, and final hypothesis, a third hierarchical multiple linear regression explained if sport-specific climate change risk perceptions predict willingness to adapt to climate change, still controlling for political conservatism. Like with H₃, H₄

sought to determine if this relationship was likewise moderated by sport identification. Scale means for MLB fans' willingness to adapt served as the dependent variable. Political conservatism was entered into the first block as a covariate, and significantly predicted fans' willingness to adapt ($R^2 = .008$, $F(1, 538) = 4.48$, $p = .04$). Sport-specific climate change risk perceptions and the scale mean for sport identification were entered in the second block. The moderator term (S.-S. CCRPxSport ID) was added in the third block. Overall, the addition of variables significantly predicted general climate change risk perceptions ($\Delta R^2 = .001$, $F(1, 535) = 0.61$, $p = .43$), but non-statistically significant main effects are discussed below. The regression results are presented in Table 13. The regression results are presented in Table 13.

Results for Hypothesis 4

H₄- Sport identification will moderate the relationship between MLB fans' sport-specific climate change risk perceptions and their willingness to adapt to climate change.

Results of the third regression analysis revealed sport-specific climate change risk perceptions was a statistically significant predictor of MLB fans' willingness to adapt ($B = 0.68$, $p < .001$). However, the main effect for sport identification was not statistically significant ($B = -0.01$, $p = .89$). Likewise, when examining if this relationship was moderated by their sport identification, differences in willingness to adapt were not statistically significant ($\Delta R^2 = .001$, $F(1, 535) = 0.61$, $p = .43$). Like in the previous analysis, the independent variable, sport-specific climate change risk perceptions, had a strong relationship with willingness to adapt, but revealed no differences among

differently identified fans. Implications of this relationship are discussed in the next chapter.

Table 13

Results of Hierarchical Multiple Linear Regression for Willingness to Adapt

	Measurement	Coefficients			<i>p</i>	<i>F</i>	<i>R</i> ²	ΔR^2
		<i>B</i>	<i>S.E.</i>	β				
1	--	--	--	--	--	4.48*	.008	--
	(Constant)	4.52	.16	--	.00	--	--	--
	Pol. Conservativism*	-0.08	-.04	-.09	.04	--	--	--
2	--	--	--	--	--	225.27**	.461	.453
	(Constant)	1.41	.20	--	.00	--	--	--
	Pol. Conservativism	-0.03	.03	-.03	.33	--	--	--
	Sport. Spec. CCRP**	0.68	.03	.68	.00	--	--	--
	Sport ID	-0.001	.03	-.001	.98	--	--	--
3	--	--	--	--	--	0.61	.462	.001
	(Constant)	1.42	.20	--	.00	--	--	--
	Pol. Conservativism	-0.03	.03	-.03	.30	--	--	--
	Sport. Spec. CCRP**	0.68	.03	.38	.00	--	--	--
	Sport ID	-0.01	.03	-.006	.89	--	--	--
	S.-S. CCRPxSport ID	0.04	.05	.03	.43	--	--	--

* Indicates significance at the $p < .05$ level

** Indicates significance at the $p < .01$ level

Summary of Results

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. Specifically, this study explored the predictability of general climate change risk perceptions based on MLB fans' climate change attitudes, as well as the moderating role sport identification plays on fans' sport-specific climate change risk perceptions and willingness to adapt. This research utilized a cross-sectional

survey design, and was subject to instrument pretesting to ensure the validity and reliability of the survey instrument. Ahead of data collection, an expert panel review and a field test were conducted, ensuring instrument validity and clarity.

The survey was developed using Qualtrics software, and modifications based on the series of pretests were made online. The survey was administered as a HIT on MTurk to be completed by Amazon MTurk workers in the U.S. who self-identified as MLB fans. After 1,254 survey attempts, a total of 540 were useable surveys were used for data analysis. A CFA was performed to ensure the factor structure supported by the literature was appropriate for the present study. Results of the CFA indicated the six-factor model, one for each of the study's key variables, provided a good model fit for the data.

To test the four hypotheses, a series of three hierarchical multiple linear regressions were conducted. The data met all of the key assumptions of hierarchical multiple linear regression, permitting the continuation of analysis. Climate change attitudes, the independent variables for H_1 (skepticism) and H_2 (experiential processing) each predicted MLB fans' general climate change risk perceptions. As hypothesized in H_1 , skepticism negatively predicted the outcome variable ($B = -0.50$), and accounted for 18.7% of explained variance in general climate change risk perceptions. For H_2 , experiential processing positively predicted the outcome variable as hypothesized, where generalized emotions ($B = 0.21$) and personal experiences with extreme weather ($B = 0.33$) accounted for 3.6% and 15.5% of variance explained, respectively. While each attitudinal factor did have a significant influence on MLB fans' general climate change risk perceptions, personal experiences with extreme weather was the most effective positive driver.

The second hierarchical multiple linear regression found general climate change risk perceptions positively predicted MLB fans' sport-specific climate change risk perceptions ($B = 0.72$). However, H_3 posited sport identification would moderate the relationship between fans' general and sport-specific climate change risk perceptions, which was not supported having only explained 0.1% of variance ($B = -0.05, p = .38$). The third hierarchical multiple linear regression sought to test the fourth, and final, hypothesis in the present study. This analysis found that while sport-specific climate change risk perceptions did positively predict MLB fans' willingness to adapt ($B = 0.68$), this relationship was not moderated by fans' sport identification ($\Delta R^2 = .001$).

Table 14 summarizes the findings from the analysis. It should be noted that political conservatism and sport identification were also significant predictors of each dependent variable in the model. However, the present study controlled for the effects of political conservatism, which was found to negatively predict all three dependent variables. Additionally, the third and fourth hypotheses suggested sport identification would moderate the relationships between general and sport-specific climate change risk perceptions, as well as sport-specific climate change risk perceptions and willingness to adapt. The moderation effects were not supported. Conclusions on these analyses, as well as practical implications based on these results are discussed in the next chapter.

Table 14

Summary of Results

Dependent Variable	Significant Predictors
General Climate Change Risk Perceptions	Climate Change Skepticism (-) Generalized Emotions Personal Experiences with Extreme Weather Sport Identification

Sport-Specific Climate Change Risk Perceptions	General Climate Change Risk Perceptions
Willingness to Adapt	Sport-Specific Climate Change Risk Perceptions

CHAPTER V

DISCUSSION

The purpose of this study was to investigate relationships between U.S.-based MLB fans' sport identification and their climate change attitudes, perceptions of climate change risk, and willingness to adapt. In particular, this study explored the influence of MLB fans' climate change attitudes on their general climate change risk perceptions, and whether sport identification played a moderating role between fans' general and sport-specific climate change risk perceptions, and their sport-specific climate change risk perceptions and willingness to adapt. The following hypotheses were developed to test these relationships:

H₁- Climate change skepticism will negatively influence MLB fans' general climate change risk perceptions.

H₂- Increased climate change experiential processing will positively influence MLB fans' general climate change risk perceptions.

H_{2a} – Generalized emotions will positively influence MLB fans' general climate change risk perceptions.

H_{2b} – Personal experience will positively influence MLB fans' general climate change risk perceptions.

H₃- Sport identification will moderate the relationship between MLB fans' general climate change risk perceptions and their sport-specific climate change risk perceptions.

H₄- Sport identification will moderate the relationship between MLB fans' sport-specific climate change risk perceptions and their willingness to adapt to climate change.

This chapter contains five primary sections: First, an interpretation of the results which will discuss the findings related to each hypothesis. Then, a review of the study's theoretical implications as they pertain to sport's ability to advance sport ecology research and climate action are discussed. Next, practical implications based on the findings of the present study will be discussed for MLB and sport's contribution to climate action as suggested by the UN's Sport for Climate Action Framework. Then, limitations of the study will be explained, which ultimately contribute to the final section, recommendations for future research.

Interpretation of Results

Data Collection Process and Sample Characteristics

The data collection process for this study and the resulting sample contribute to the literature in several ways. First, the national sample accessed through MTurk resulted in a robust and diverse dataset. While sport ecology is a burgeoning subdiscipline of sport management, and climate studies in sport are growing, the present study was one of the first forays into fans' climate change attitudes and risk perceptions. As such, the data collection process yielded a broad cross-section of MLB fans. The sample represented fans of all 30 MLB teams, and residents from all but four U.S. states. The broad

perspective of U.S.-based MLB fans for the present study may support future case studies on fans of a given team or geographic region. MTurk provided a feasible way to access a large subset of MLB fans while avoiding sampling bias.

Because participants were recruited through MTurk, and met parameters for inclusion in the study, the sample, overall, was representative of MLB fans. Differences, however, were found for age and political party affiliation. Generally, MTurk workers are younger than the average U.S. working population (Pew Research Center, 2016a). Likewise, MTurk workers differ in political partisanship from the working population, where a plurality of MTurk workers identify with the Democratic Party (Levay et al., 2016). Conversely, MLB fans are more likely to be older and politically Republican than fans of other major sport leagues (Johnson, 2020; Silverman, 2020). The mean age for this study's sample was 41.1 years, nearly two years older than the MTurk average and 16 years younger than MLB fan average age (Johnson, 2020; Pew Research Center, 2016a). Nearly 56% of the present study's sample identified with the Democratic Party, above the 2016 average for MTurk workers (46.1%; Levay et al., 2016). The predominantly Democratic sample further substantiated the need to consider political conservatism as a separate measure, as it has historically influenced climate change attitudes and risk perceptions in the general public (McCright & Dunlap, 2011b; Pew Research Center, 2015). Contextually, composite sampling of MTurk workers took place in 2016, ahead of the U.S. Presidential Election, but during the election cycle that would result in a Republican U.S. president (Levay et al., 2016; Pew Research Center, 2016a). Data collection and analysis for the present study occurred following the 2020 Presidential Election and 2021 Presidential Inauguration of a Democratic president.

Beyond age and political party affiliation, the sample's representativeness of MLB fans suggests MTurk is an appropriate online convenience sampling tool.

General Climate Change Risk Perceptions

The first hierarchical multiple regression tested the influence of U.S.-based MLB fans' climate change attitudes on their general climate change risk perceptions for hypotheses 1 and 2. Results suggested political conservatism, the covariate, was a strong negative predictor ($sr^2 = -.33$) of fans' general climate change risk perceptions. This finding is consistent with literature examining the political influence on climate change attitudes, particularly in the U.S. (McCright & Dunlap, 2011a). While political conservatism was controlled for, climate change skepticism also negatively predicted general climate change risk perceptions for MLB fans ($sr^2 = -.40$).

Consistent with the literature, increases in skepticism led to reduced general climate change risk perceptions. Kahan et al. (2011) describe this inverse relationship between skepticism and perceived climate risks as the product of limited scientific knowledge among the general public. This limitation is only exacerbated by the complexity of climate science and the ways in which climate change information is framed. Further, Kahan et al. (2011) describe a causal chain of climate change skepticism: where personal attributes inform values and a person's informational processing, and if that lacks a scientific foundation there is opportunity for climate change skepticism to exist, which leads to the dismissal of climate change, and lower perceptions of its severity and threat.

This finding means those who are more skeptical of climate change typically have lower perceptions of its risks, and fewer concerns for perceived risks. Haltinner &

Sarathchandra (2018) found the personal attributes most closely correlated with climate change skepticism were older age, White, male, and politically conservative. Based on the literature, this would correspond with the demographic factors of those least likely to perceive climate change risk. This, largely, is the composition of MLB fans (Carter, 2019). McCright (2016) specifically cited higher observations of climate change skepticism in the U.S. than in other developed countries, an added layer separating U.S.-based MLB fans from greater risk perceptions. This consideration is important for the remaining analyses and future research: if not just generally, climate change skepticism may obscure MLB fans' ability to also perceive climate change risks specific to the sport. Disconnect between MLB's climate vulnerability and fans' ability to perceive those risks on the sport they enjoy will persist without conscientious efforts to communicate such vulnerabilities.

However, skepticism has a purpose that should not go unnoticed. Psychologically, climate change skepticism has been studied as a mental model, or tool, used to avoid the harsh realities of a changing climate (Spence et al., 2011; Whitmarsh, 2011). This means, for those who are more skeptical of climate change and have lower perceptions of its risks, are also less likely to be concerned. Haltinner and Sarathchandra (2018) refer to this as a coping strategy, while Hoffman (2015) refers to this as information avoidance. In either case, skepticism serves as a means to ignore the effects of a changing climate.

Reducing psychological distance, or the ability to put climate change out of sight and mind, for MLB fans requires them to pay attention to climate change. This is the role of experiential processing attitudes. Experiential processing attitudes (e.g., generalized emotions and personal experiences with extreme weather) make climate change personal,

and should have a positive effect on risk perceptions, which was found to be the case in this study.

Personal experiences with extreme weather was the strongest predictor of the climate change attitudes ($sr^2 = .48$). Personal experiences with extreme weather uniquely predicted MLB fans' climate change risk perceptions, confirming feeling, experiencing, and perhaps recovering from, the severe manifestations of a changing climate accelerate perceptions of climate change risk. This finding is consistent with climate change experiential processing research, which refers to ways in which humans process and evaluate information through emotions and lived experiences (Gadeikis et al., 2017). Namely, Leiserowitz (2006) found emotional processing, or feelings, affected a person's judgement of climate change. Likewise, Haltinner and Sarathchandra (2018) found individuals having more personal experiences with climate harm had lower levels of climate change skepticism. These findings are also consistent with research on the psychological distance of climate change, and climate harm (Spence et al., 2011).

The U.S. is a nation whose development and wealth can seemingly insulate its population from the realities of climate change, while poorer developing countries are inherently more vulnerable. While aspects of this may be true, given wealth and resources are critical for adaptive capacity to recover from the effects of climate, changes in global climate profoundly affect the U.S. as well. Some of the most tangible pieces of evidence of this change are extreme weather events like hurricanes, catastrophic flooding, and wildfires, which are happening more frequently and severely across the U.S. The sense of climate insulation in the U.S., due to the country's resources and wealth, does not equate to immunity or protection. Because climate change refers to the accumulation

of subtle changes for a region over time, these fluctuations are difficult to observe. The psychological distance between oneself and the realities of climate change can be reduced by having a direct, personal connection to climate change's effects. So, while generalized emotions, or what a person feels, about climate change was also a positive predictor, feelings were not the most substantial experiential processing attitude for fans.

Climate change, like COVID-19, unequally affects people worldwide, and exaggerates existing inequalities which allow psychological distance to exist. A common analogy explaining inequitable differences is that humanity is weathering the same storm, but in different boats (Ware, 2020). In other words, those with social and financial capital are more resilient and inherently better off than those who do not. Much like wealthy, industrialized nations have greater adaptive capacities than developing ones. Personal experiences with extreme weather help individuals understand what life is like for those who face greater climate vulnerabilities on a regular basis, thus reducing psychological distance between oneself and the realities of climate change.

While emotional information processing is a driver of climate change judgement and risk perceptions (Smith & Leiserowitz, 2012), this spectrum is just one-dimensional: positive or negative feelings. A phenomenon as complicated and as deeply connected with every aspect of life on Earth is mis-represented by emotional judgement. Although significant, generalized emotions' prediction of general risk perceptions was superseded by skepticism and personal experiences with extreme weather events. All three of these attitudes operate in a cognitive network, where they each have the ability to influence a person's risk perceptions (Reser et al., 2012; Spence et al., 2011). A person can have

personal experiences with extreme weather events in their regular life, and as an MLB fan.

Devastation, evacuations, increased insurance premiums, power outages, property damage, and health risks that are associated with experiencing and recovering from extreme weather events make the effects climate change more tangible in a person's life. On Americans' prioritization of risks, Weber (2016) describes a front-burner, back-burner effect, where issues that seemingly are more pressing risks at a given time move to the general public's front of mind. Shifting risks from the back-burner to the front-burner occur in light of terrorist attacks, mass shootings, pandemic outbreaks, economic or political unrest, and events of extreme weather alike. Each of these are instances that pose long-term consequences, but primarily for those who directly experience the repercussions.

Hypotheses 1 and 2 reaffirmed the role attitudinal influences on climate change risk perceptions that have been studied in-depth among the general American public are applicable for U.S.-based MLB fans (Bertoldo et al., 2019; Leiserowitz et al., 2020; Poortinga et al., 2011). Among the general public, this relationship is well-established, while the present study provides early support for this relationship within a sport context. Ultimately, U.S.-based MLB fans are no different in their general climate change risk perceptions, and the attitudes that influence them, than the American population. While skepticism was a significant predictor, personal experiences was the strongest predictor of general climate change risk perceptions. The potential for sport fandom to elevate those who identify with MLB to greater climate change risk perceptions and subsequent behavioral changes above the general population is addressed over the next two sections.

Sport-Specific Climate Change Risk Perceptions

The second hierarchical multiple linear regression tested the third hypothesis, whether sport identification would moderate the relationship between general and sport-specific climate change risk perceptions for U.S.-based MLB fans. The purpose of this hypothesis was to see if differences existed between general and sport-specific climate change risk perceptions for MLB fans, specifically if the climate change risks to MLB were more important for those who were more connected to the sport. This hypothesis also served to help explain the U.N.'s justification as leveraging sport for climate action, by demonstrating fans perceive climate change as something that affects American sport. Results indicated while general risk perceptions strongly predicted sport-specific ones ($B = 0.72$), sport identification did not moderate that relationship ($p = .38$). Again, political conservatism served as the covariate, which, as anticipated, continued to negatively influence the outcome variables of interest in the present study ($B = -0.07$).

Upon exploring the significance of the relationship between general and sport-specific climate change risk perceptions, findings indicate fans' ability to translate perceived climate change risks on the natural environment to MLB, specifically. Baseball fans who perceived general climate change risks were more likely to perceive sport-specific climate change risks, which is particularly meaningful for the future of climate change awareness and adaptation for American sport given the prevalence of climate change skepticism and uncertainty in the U.S. So, while not every participant indicated having frequent personal experiences with extreme weather (H_{2b}), fans who were able to perceive climate change risks generally (e.g., on the natural environment, and on the U.S.) were able to do the same for MLB. This finding is considerable given MLB's

unique climate vulnerability, and existing adaptation strategies like stadium replacement and redesign catalyzed by a changing climate and MLB's susceptibility to extreme weather (Kellison & Orr, 2020; Skeens, 2019). This finding implies there is a relationship between general and sport-specific climate change risk perceptions. That is, people who perceived general climate change risk perceptions were more likely to perceive risk perceptions specific to MLB. For this reason, it was equally important to assess the role sport identification played in this relationship.

Sport identification did not moderate the relationship between general and sport-specific climate change risk perceptions, meaning fans who perceive general climate change risks are more likely to perceive MLB-related risks, regardless of their degree of identification with Major league Baseball. Despite not moderating the relationship, sport identification significantly predicted sport-specific climate change risk perceptions, meaning those respondents more highly identified with Major League Baseball were more likely to perceive climate related risks specific to their sport. Much like the effects of personal experiences with extreme weather on general climate change risk perceptions, in the context of Major League Baseball, fans experience the repercussions of a changing climate: rainouts, lightning delays, and extreme heat, as well as game postponements, cancellations, and stadium renovations for environmental protection. Each of these are personal experiences, whether communicated as an outcome of climate change or not. Those more attached to the sport are more likely to be aware of and concerned by these threats.

Willingness to Adapt

The third hierarchical multiple linear regression tested the fourth hypothesis, whether sport identification moderated the relationship between sport-specific climate change risk perceptions and U.S.-based MLB fans' willingness to adapt. The purpose of this final analysis was to see if sport identification could elevate the attitudinal and perception-based findings into action. Leveraging sport for climate action requires just that. Climate adaptation requires cooperative solutions; therefore, this hypothesis posited the unifying nature of sport fandom could be the source of such cooperation. Results, like in the previous analysis, indicated while sport-specific climate change risk perceptions did positively predict fans' willingness to adapt ($B = 0.68$), sport identification did not moderate this relationship either ($p = .43$). Again, political conservatism served as the covariate, which negatively predicted fans' willingness to adapt ($B = -0.08$). Likewise, in the absence of political conservatism, findings suggested sport-specific climate change risk perceptions influenced fans' willingness to adapt.

These results suggest fans perceiving greater climate change risks to Major League Baseball were more likely to be willing to adapt their personal behaviors. This finding illustrates the connection between cognition and action, which is valuable for this study's practical implications. Finding fans' willingness to adapt their climate related behaviors due to their perceptions of climate change risks specific to Major League Baseball suggests an individual's climate change attitudes influence their behavioral intentions as well. Yet, as with the previous analysis, sport identification did not moderate the relationship between sport-specific climate change risk perceptions and fans' willingness to adapt.

Sport identification, also, did not directly predict fans' willingness to adapt meaning more highly identified fans were not any more willing to adapt behaviors that reduced climate harm (e.g., choosing to walk or bike) than others. The sample consisted only of individuals who self-identified as MLB fans among other sport options. Because this study did not solicit solely highly identified fans, e.g., season ticket holders, the degree to which participants identified as MLB fans varied from casual to avid. This approach was taken so the sample would be more representative of all MLB fans, and to reduce sampling bias.

Regardless of their sport identification, however, sport-specific climate change risk perceptions did predict fans' willingness to adapt. Specifically, findings revealed respondents were willing to adapt their climate-related behaviors when they perceived climate change to be a risk to MLB. This finding illustrates the primary premise of the study, that sport can motivate the general public to adapt to climate change. The present study found fans are moved to act for climate adaptation in response to negative stimuli: their perceptions of risk to Major League Baseball. Climate change risk perceptions are defined as "the perceived likelihood of negative consequences to oneself and society" as a result of climate change and its associated impacts, like extreme weather (O'Connor et al., 1999, p. 462). This means U.S.-based MLB fans were able to conceptualize climate change risks to the sport as negative consequences. This uproots the historical lack of support for climate change in the U.S. Upon revisiting Jacques Barzun's quote memorialized in the MLB Hall of Fame, "whoever wants to know the heart and mind of America had better learn baseball, the rules and realities of the game," this quote applies to climate change (Roberts, 1982, p. 145). Whoever wants to know about climate change

support in America had better learn baseball too, because the present climate change risks to MLB are the realities of the game.

The present study found if people feel something they cherish is threatened by climate change, they will do something about it. Climate change risks that threaten MLB reduces the psychological distance between U.S.-based MLB fans and climate change. In fact, this distance was reduced enough, that is the sense of insulation falsely protecting Americans from climate change, to motivate fans' willingness to adapt their regular behaviors. If understanding America's oldest, and favorite pastime is critical to understanding the country, as written by George Grella (1976), then understanding the climate change risks to the sport is likewise critical to understand the potential for climate action in the U.S.

This finding is what, until this point, the U.N. only suggested the power of sport could do for climate action (United Nations, 2018). Therefore, this finding has profound implications for the league, and global climate leaders like the U.N., which are discussed in the coming sections. The present study found sport identification helps reduce the psychological distance between sport fans and climate change, by separating general and sport-specific climate change risks and focusing fans' attention on the risks germane to MLB. This study also found MLB's climate vulnerability may help shape what any fan, avid or casual, may be willing to do in response to climate change risks.

Theoretical Implications

There are a few key theoretical implications that have arisen as a result of the present study's findings. While the theoretical framework for the present study was social identity theory, it did not explicitly frame the relationships found. Moreover, social

identity theory did not explain the significance of sport identification for MLB fans on climate change. However, insight from the observed relationships advance other theoretical underpinnings in different ways, namely: a) sport as a means to connect natural and social sciences, b) and sport as a tool to break down barriers between natural and social sciences, and c) sport's socio-cultural ability to advance climate action.

The present study demonstrated sport identification is a means that connects natural and social sciences, by finding sport identification predicts a significant amount of sport-specific climate change risk perceptions. This means, climate change research in social sciences like psychology, sociology, and anthropology can add a sport context when exploring humans' relationships with climate change. Historically, climate change matters to people when its detrimental outcomes affect them personally, this is the aforementioned notion of a *front-burner* effect. The U.S.'s wealth and industrialization deceptively insulate Americans from persistent climate risks, permitting the sheer existence of a *back-burner*. Yet, climate change occurs in small increments regularly over time. Subtle increases in global temperatures or sea level are hardly noticeable by a person during their lifetime. What connects humans, socially, to this scientific phenomenon are the events of extreme weather catalyzed by climate change. Likewise, these are the occurrences that threaten the ability to enjoy sport.

Conversely, sport fans gleaning climate change perceptions through sport also justifies sport serving as a tool to remove barriers between natural and social sciences. A considerable barrier separating people from potential climate action, as found in the present study, is climate change skepticism. The current study's findings support the extant literature on the attitudinal role of climate change skepticism, and the ways

skepticism contributes to the dismissal of climate change risks (Sundblad et al., 2007). Skepticism refers to attitudinal disbelief, doubt, or denial about the presence, causation, or severity of climate change (Egan & Mullin, 2017). However, the present study found U.S.-based MLB fans perceive both general and sport-specific climate change risks to an extent but perceive greater sport-specific risks when they are more identified with the sport. Skepticism is more prevalent among older, White, male, political conservatives in the U.S. (Ballew et al., 2020; Haltinner & Sarathchandra, 2017). Likewise, this is the average composition of MLB fans (Carter, 2019). It is this juxtaposition that makes climate action through MLB particularly difficult. Sociologically, Hoffman (2015) writes people interpret and validate science through their worldviews and filter out the rest. This is the challenge in communicating scientific information to people who lack a scientific knowledge base or are demographically predisposed to be skeptics: climate change science gets filtered out. Worldviews are shaped by personal experiences, and personal experiences proved to be the strongest predictor of climate change risk perceptions. This means scientific information can, in fact, be perceived and interpreted if a sport fan's worldview acknowledges climate change and its detrimental effects through personal experiences.

Sport's ability to connect social and natural science, and remove barriers between people and the climate issue, does not equate to climate action or climate advancement. While social identity theory did not explain fans' willingness to adapt based on their identification with MLB, the connection between risk perceptions and climate related behavioral change among fans was supported. This means, there is a direct link between sport's climate vulnerability and consumer behavior in sport. Additionally, sport was

found to be a social factor that shapes a person's risks perceptions, as hypothesized. This suggests sport operates, socio-culturally, in a similar manner as religious and political affiliations. Religion and politics are the two most prevalent ideological influencers of the general public's climate change understanding because they help people create meaning and a sense of belong, and attach responsibility to positive and negative circumstances (Huddy, 2001; Jenkins et al., 2018; Wann & Grieve, 2005). If political and religious ideologies are to remain the sources of contention preventing the U.S. from advancing climate change perceptions beyond the scientific community, this study found a unique niche for sport to transcend such divides.

MLB fans, due to the sport's intrinsic relationship with American culture, are an optimal sample to continue testing theoretical foundations between sport and climate action. Namely, future research should examine the present model through risk perception theory (Leiserowitz, 2006; Sundblad et al., 2007) to strengthen relationships between perceptions of general and sport-specific climate change risks, and cognitive dissonance theory (Festinger, 1957) to examine differences between fans' cognitions (e.g., climate change attitudes) and their behaviors (e.g., willingness to adapt). However, because sport-specific climate change risk perceptions increased as sport identification increased, there is support for the continued use of social identity theory in sport ecology research, specifically in climate change studies within sport. The application of humans' social connectivity to each other through sport and the wellbeing of the planet will be critical to the advancement of such research.

Practical Implications

The present study attempted to not only bridge gaps between sport and climate change research but sought to specifically provide empirical evidence to support the U.N.'s claim that sport can be leveraged for climate action through fans. Additionally, this study sought to address the divide between a revered tradition in American culture, Major League Baseball, and a highly contested issue in the U.S., climate change. These competing perspectives and the results of this study provide practical implications for MLB to advance sport-related discourse on climate vulnerabilities and adaptation, and for the U.N. to substantiate their recommendation that sport can advance climate change action and awareness.

Major League Baseball

This study provides early empirical support for U.N.'s Sport for Climate Action Framework, which is discussed in the next section, but it is the first investigation into climate change attitudes and risk perceptions of fans of a major American sport league. For MLB, and its 30 teams, the current study demonstrates fans who perceive climate change, generally, also perceive climate change as a risk to the sport. Additionally, findings show individuals who are more identified with Major League Baseball have greater MLB-specific climate change risk perceptions. Together, this provides context for climate change education to take place through sport. Educational awareness and communicating similarities between the climate risks faced by MLB and those faced personally by fans can lead fans to be more willing to change their behaviors. These findings reveal fans' cognitive attributes (attitudes and risk perceptions) and behavioral willingness could become opportunities for the league's and teams' climate adaptation strategies and environmental sustainability efforts. To date, MLB's pro-environmental

efforts that include fans are centered on environmental sustainability goals like recycling and composting, mirroring the dearth of sport ecology research on these efforts in the sport sector (MLB 2019a; MLB 2019b; Trail & McCullough, 2020). However, an opportunity is missed by not engaging fans specifically in climate adaptation. Fans' direct involvement in climate adaptation at the team and league level would also contribute to their personal experiences, the experiential processing attitude with the greatest propensity to influence fans' risk perceptions and subsequent behavioral changes.

Skepticism predicts MLB fans' general risk perceptions in the same way it predicts the general public's. However, fans also perceive climate change risks specific to MLB. Fans' sport-specific risk perceptions increase as sport identification increases. This finding is important for MLB's climate decision-making, as it indicates fans who are highly identified with the sport perceive climate change as a risk to the sport, ultimately a risk to their fandom. Yet because of its controversiality, discussing climate change in the American sport sector is avoided, to prevent alienation of stakeholders (Kellison & Cianfrone, 2017). This conscious avoidance may be doing more harm than good, as fans perceive MLB to be at risk. MLB should communicate its vulnerability to fans in order to garner support for adaptation. Further, because fans perceive climate change risks to the sport, MLB can cite climate vulnerability as a driver of its decision-making.

Risk perceptions, however, do not equate to understanding. Whether fans, regardless of sport identification, understand rainouts and extreme heat are climate change outcomes is uncertain. However, baseball's unique climate vulnerability and its adaptations (e.g., building roofed stadiums) are opportunities for MLB to frame the climate issue through sport. MLB should communicate climate change as it pertains to

the survivability of the sport, in order to alleviate the popular confusion attributed to complicated scientific models and the polarization of climate change framing.

Communication of the probable climate risks faced by MLB is a recurring theme of this study's findings and guides the practical implications and recommendations for future research. However, the demographic makeup of MLB fans sheds light on why the explicit truth about climate change's impact on MLB explains, at least partially, why the efforts to communicate it are not happening. However, finding personal experiences resonate with fans and fans perceive climate change risks more when they are more identified with the sport suggests it is time to have these conversations for the sake of the sport.

Finally, if fans are to remain key stakeholders for sport organizations (Dolf & Teehan, 2015), it is beneficial for MLB to know what fans are willing to do to protect and preserve the sport. Because fans are, generally, willing to adapt their behaviors as a result of their climate change risk perceptions, MLB should discern which specific climate actions and environmental sustainability efforts fans would be willing to engage in. Based on this study's findings, those efforts should be geared toward mitigating climate risks on the sport. Ultimately, this can help MLB's bottom line, as fans who perceive climate change risks as a threat to the sport are willing to support climate action behaviorally. This will help provide direction and support for the efforts that MLB already conducts (Footer, 2020; Trendafilova et al., 2013). It will also provide support for potential future climate adaptation strategies, like a league-wide relief fund for climate impacts, such as events of extreme weather. Additionally, it will provide another attachment point for fans to feel involved in organizational efforts. Because climate

action revolves around cohesion and cooperation, rather than exclusivity and categorization, the sport organization and its fanbase can generate a concerted effort to achieve environmental protection.

United Nations

Implication 1.1.7 of the Sports for Climate Action Framework (United Nations, 2018) states most fans recognize sport sector's contributions to climate change. It further states the power and visibility of sport provides, "a strong platform for the sport sector to play an exemplary role in meeting the challenge of climate change, and inspire and engage large audiences to do the same" (United Nations, 2018, p. 3). However, the framework does not provide communicable evidence of either generalization. Additionally, not all sport organizations are signatories to the framework despite this claim.

This study found U.S.-based MLB fans do perceive climate change is a risk to the sport, and are willing to adapt their behaviors regardless of their identification with the sport. The U.N. should include this empirical evidence in its efforts to engage the sport sector, and seek to continuously support their claims, to demonstrate this implication. The U.N. should also support sport ecology research that seeks to advance the goals and implications of the Sports for Climate Action Framework.

The categories of action items for sport organizations to take in accordance with the UNFCCC Secretariat include the following: Avoid, Reduce, Substitute, Compensate, and Report – each corresponding with steps sport organizations can take to mitigate their climate impact. Interestingly, communication is not of these action items. Instead, the Sports for Climate Action Framework emphasizes the importance of communicating with

fans and key stakeholders as the fifth, and final, commitment principle for sport organizations:

1. Principle 1: Undertake systematic efforts to promote greater environmental responsibility;
2. Principle 2: Reduce overall climate impact;
3. Principle 3: Educate for climate action;
4. Principle 4: Promote sustainable and responsible consumption;
5. Principle 5: Advocate for climate action through communication. (United Nations, 2018, p. 5)

If these are to remain the key principles the U.N. has outlined to consolidate the sport sector's evidence for climate action, communication should come first. Based on this study's model, findings, and practical implications for MLB, communication of sport's climate vulnerabilities should be one of the first primary principles and organizational action items. Promoting environmental responsibility and climate action education are both listed before communication. However, with climate adaptation being the ultimate goal, this study found risk perceptions influence such behavioral willingness. To increase fans' willingness to make climate-related changes, early and effective communication of such risks at the organizational, national, and global levels is imperative. Finally, this study's results provide context for the U.N. to encourage MLB and all its member teams to become signatories to the Sports for Climate Action Framework. Currently, only the New York Yankees and New York Mets have signed in support, however fans of all 30 teams were represented in the present study's sample.

Limitations

The present study focused solely on U.S.-based fans of MLB. So, while the results of this study may provide insight into other sport leagues, or other baseball leagues (e.g., MiLB), additional climate change research specifically on fans of other sports and geographic locations is needed. Online convenience sampling via MTurk resulted in a large, representative dataset. However, future studies focusing on fans' identification should collect data during the season, thereby activating connection to the sport. For the present study, there was opportunity for sport disconnect as the data were collected before the start of MLB season, and during the COVID-19 pandemic. The ideal data collection setting would take place in-person and in-season to activate fans' identification and express connection to Major League Baseball. The relative removal of this data collection process may have resulted in less accurate and representative results than if fans were presently engaged in the sport.

Further, the scope of sport identification is broader than individual team identification. Team identification research, although abundant in sport management, has not been examined in the context of climate change risk perceptions and willingness to adapt. Practical implications from the present study suggest a case study approach into a specific MLB team's fan base may provide additional inroads for climate change risk perceptions and adaptation willingness specific to the team. Likewise, the present study adopted and adapted climate change risk perception measures to be used in a sport context. Sport-specific measures for climate change attitudes and risk perceptions will be needed to continue the advancement of climate-focused sport ecology research. While the present study's instrument proved valid and reliable, efforts to grow additional measures will increase the applicability of climate understanding for sport industry research.

Future Research

The impetus for this study was that MLB's unique vulnerability to climate change conflicts its indispensability to American sport culture. Additionally, the historic composition of MLB fans, demographically, has been the least likely to engage in climate action. Yet, the U.N. Secretariat for Climate Change asserts sport can be leveraged for climate action, including at the consumer and fan levels. These competing perspectives do not alleviate MLB's vulnerability to climate change. However, forays into MLB fans' attitudes, risk perceptions, and willingness to adapt, and the limitations of the present study, provide opportunities for additional research and discourse.

Because the overall model was significant, this is an indication that MLB and its teams can specifically market climate adaptation and environmental sustainability efforts to fans for additional support. Future research should explore ways in which MLB communicates these efforts, raises awareness of its own vulnerabilities, and engages fans. However, because sport identification did not moderate the relationships of interest in this study, researchers should also consider the strategic involvement of fans in the implementation of climate mitigation strategies based on perceived risks. For example, focus groups of MLB fans who have personal experiences with extreme weather may help strengthen the relationship between general and MLB-specific climate change risk perceptions. Subsequent studies can explore additional antecedents that shape and inform sport fans' climate change attitudes, risk perceptions, and willingness to adapt.

Regarding the direct involvement of fans, the degree to which MLB communicates its own climate change risks and vulnerabilities should be explored. Because of the controversial nature of climate change, fans' role as key stakeholders, and

the potential to alienate fans as a result of organizational decision-making, future research should examine the efficacy of MLB climate communication strategies. The present study did not provide participants with information regarding MLB's climate vulnerability. However, results indicate these conversations should be had, and additional awareness is needed.

Summary of Study

Climate change poses a significant threat to aspects of human life, including sport. Although the scientific community has reached consensus on the presence and severity of climate change, varying attitudes and perceptions exist across the general public (IPCC, 2018). The effects of a changing climate disproportionately affect developing nations and regions. However, its consequences are reckoned with worldwide, and the U.S. is no exception. In the U.S., there is a sense of psychological distance from the realities of climate change due to the nation's industrialization and wealth. Further, ideological influencers like political religious affiliations frame American's perceptions of the scientific phenomenon. These cultural categorizations prevent widespread climate support in the U.S.

The present study suggested sport can serve as an opportunity for cooperative climate support in light of the call to action by the United Nations (2018) Sports for Climate Action Framework. Major League Baseball is particularly vulnerable to climate change given the duration of the season, large geographic footprint, and predominantly outdoor gameplay. As America's oldest and favorite pastime, this sport provided context to compare climate change, a critically debated topic in the U.S., and MLB, a symbol of American culture. Because fans are a key stakeholder group (Dolf & Teehan, 2015), it is

valuable for MLB to understand its fan base's climate change attitudes and perceptions of risk. These understandings were then translated into action in order to advance the U.N.'s stated goals.

This study found skepticism and experiential processing (e.g., generalized emotions and personal experiences with extreme weather), each climate change attitudes, to significantly predict fans' general climate change risk perceptions. This established the sample of U.S.-based MLB fans perceived the risks of climate change. Then, this study found those who perceive climate change risks generally, also perceive risks to MLB. Not only that, but the MLB-specific risk perceptions increased as participants' identification with the sport increased. From there, this study was ultimately able to provide empirical evidence for the U.N.'s claim that sport can be leveraged for climate action among fans by significantly predicting fans' willingness to adapt to climate change as a result of their perceived risks to MLB.

These are novel findings that advance sport ecology and climate change research. Specifically, the present study demonstrated that fans who felt climate change threatened the sport were more likely to adapt their behaviors. Theoretically, this reduces the psychological distance between Americans and climate change (Spence et al., 2011). Additionally, these findings provide practical implications for MLB and the U.N. by providing a foundation to support climate change education and awareness through sport, and further engaging fans in climate adaptation strategies within sport organizations.

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APPENDIX A

Study Survey Instrument

Section 1 – Inclusion and Exclusion Criteria

- 1) Are you 18 years of age or older?
 - Yes
 - No
- 2) Are you a current resident of the United States?
 - Yes
 - No
- 3) Select your favorite Major League Baseball (MLB) team.
 - Drop-down menu of all 30 MLB teams
 - Include “I am not a fan of an MLB team” option
- 4) In an average season, how many [insert team name] games do you attend?
 - 0 games
 - 1-5 games
 - 5-10 games
 - More than 10 games
 - Every game
- 5) Enter residential zip code (for demographic purposes only)
 - Text box for zip code limited to 5 characters

Section 2 – Climate Change Skepticism (Spence et al., 2011)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Strongly disagree” (1) to “Strongly agree” (7) Unless otherwise noted. Items will be reverse-scored as necessary
- 1) Thinking about the causes of climate change, which, if any, of the following best describes your opinion? (“I think there is no such thing” (1) to “Entirely human processes” (7)) (Reverse-scored)
 - 2) I am uncertain that climate change is really happening.
 - 3) The seriousness of climate is exaggerated.
 - 4) Most scientists agree that humans are causing climate change. (Reverse-scored)
 - 5) It is uncertain what the effects of climate change will be.

Section 3 – Generalized Emotion (van der Linden, 2015)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Very unpleasant” (1) to “Very pleasant” (7) Unless otherwise noted.

- 1) I see climate change as something that is (1 = Very pleasant, 7 = Very unpleasant)
- 2) Overall, I feel that climate change is (1 = Very favorable, 7 = Very unfavorable)
- 3) To me, climate change is (1 = Very positive, 7 = Very negative)

Section 4 – Experiential Processing (van der Linden, 2015)

Please indicate your experiences in the following statement

- Note: Each item is measured on a 7-point Likert scale from “Never” (1) to “Frequently” (7)

- 1) Considering roughly the last 5 years, how often (in total) have you personally experienced any type of *extreme weather event* in your local U.S. area? (e.g., flooding, severe heat waves, droughts, snowstorms, wildfires, hurricanes, blizzards)

Section 5 – General Climate Change Risk Perceptions (van der Linden, 2015)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Not serious at all” (1) to “Very serious” (7) Unless otherwise noted.

- 1) In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on our society? (“Very unlikely” (1) to “Very likely” (7))
- 2) How serious of a threat do you think that climate change is to the natural environment?
- 3) How serious would you rate current impacts of climate change around the world?
- 4) How serious would you estimate the impacts of climate change for the United States?

Section 6 – Sport Specific Climate Change Risk Perceptions (van der Linden, 2015, adapted)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Not serious at all” (1) to “Very serious” (7) Unless otherwise noted.

- 1) In your judgement, how likely do you think it is that climate change will have very harmful, long-term impacts on MLB? (“Very unlikely” (1) to “Very likely” (7))
- 2) How serious of a threat do you think that climate change is to MLB?
- 3) How serious would you rate current impacts of climate change on MLB?

- 4) How serious would you estimate the impacts of climate change for [insert team]?

Section 7 – Willingness to Adapt (Xie et al., 2019)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Not at all willing” (1) to “Very willing” (7).
- 1) Pay more for fuel and use my vehicle less often.
 - 2) Pay more for and use less electricity.
 - 3) Pay a higher price for consumer goods from companies with good environmental records.
 - 4) Buy more expensive electrical appliances that have better energy-efficient ratings rather than equivalent cheaper appliances.
 - 5) Increase the number of times I use public transportation, walk or cycle each week.
 - 6) Pay to offset the carbon emissions from my airplane flights to reduce carbon emissions.

Section 8 – Sport Identification (Robinson et al., 2004)

Please indicate your level of agreement with the following statements

- Note: Each item is measured on a 7-point Likert scale from “Strongly disagree” (1) to “Strongly agree” (7)
- 1) I consider myself to be a real fan of MLB
 - 2) I would experience a loss if I had to stop being an MLB fan
 - 3) Being an MLB fan is very important to me

Section 9 – Demographic Information

- 1) Select the gender you most closely identify with
 - Male
 - Female
 - Transgender
 - Do not identify as female, male, or transgender
- 2) Select the race you most closely identify with
 - White
 - Black or African-American
 - Hispanic or Latinx
 - Asian or Pacific-Islander
 - Other (Please specify)
- 3) Select which United States political party you most closely identify with
 - Constitution
 - Democratic
 - Green
 - Libertarian

- Republican
 - Other (Please list)
- 4) Indicate your level of political conservativeness
- Response type: 7-point sliding Likert scale from “Not at all politically conservative” (1) to “Very politically conservative” (7).
- 5) Select your birth year
- Drop-down menu of years 2003-1900
- 6) Select your highest level of completed education
- Some high school
 - High school graduate
 - Some college
 - 2-year college degree
 - 4-year college degree
 - Master’s or professional (e.g., M.B.A.) degree
 - Doctoral degree (e.g., Ph.D., M.D.)
- 7) Select your annual household income
- Less than \$25,000
 - \$25,000 - \$49,999
 - \$50,000 - \$74,999
 - \$75,000 - \$100,000
 - Over \$100,000

CURRICULUM VITA

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- Ph.D. University of Louisville – Louisville, Kentucky, May 2021
Educational Leadership and Organizational Development | Specialization: Sport Administration
Advisor: T. Christopher Greenwell, Ph.D.
- M.A. University of Alabama – Tuscaloosa, Alabama, May 2018
Kinesiology | Specialization: Sport Management
- B.A. University of North Carolina – Chapel Hill, North Carolina, May 2015
Exercise and Sport Science | Major: Sport Administration

PEER REVIEWED PUBLICATIONS

5. **Murfree, J. R.**, & Moorman, A. M. (2021). An examination and analysis of Division I football game contracts: Legal implications of game cancellations due to hurricanes. *Journal of Legal Aspects of Sport*, 31(1), 123-146. <https://doi.org/10.18060/24922>
4. Williams, D. P., **Murfree, J. R.**, Hawley, J., & Tutka, P. (2020). A content analysis of the *Journal of Issues in Intercollegiate Athletics*: 2008-2019. *Journal of Issues in Intercollegiate Athletics*, 13, 466-484.
3. Shreffler, M. B., **Murfree, J. R.**, Huecker, M. R., Shreffler, J. R. (2020). The imposter phenomenon and work-family conflict: An assessment of higher education. *Management in Education*, 34, 1-8. <https://doi.org/10.1177/0892020620959745>
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WORK IN PROGRESS

4. **Murfree, J. R.**, Ingram, D., & McCullough, B. P. (final edits). Critical examinations of environmental justice related to sport, recreation, physical activity and health. To be submitted to *Sustainability*.
3. **Murfree, J. R.**, Police, C. C., Pelcher, J., & Smith, D. (final edits). Adidas x Parley: An exploration of corporate social responsibility and the global plastic crisis. To be submitted to *Case Studies in Sport Management*.
2. Orr, M., **Murfree, J. R.**, & Stargel, L. (final edits). Examining rescheduling in sports as an opportunity to adapt to changing social, environmental, and business pressures. To be submitted to *Measuring Sport & Leisure*.
1. **Murfree, J. R.**, Shreffler, M. B., Shreffler, J. R., & C. C. Police. (final edits). Imposter phenomenon and the increased work demands on sport management faculty. To be submitted to *The Journal of Hospitality, Leisure, Sport & Tourism Education*.

BOOK CHAPTER

1. McCullough, B. P., & **Murfree, J. R.** (forthcoming). Sustainable Development Goal 13: Urgent Climate Action. In McCullough, B. P., Kellison, T. B., & Melton, E. N. (Eds.). *The Routledge handbook of sport and sustainable development*. London: Routledge.

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1. Swim, N. M., **Murfree, J. R.**, & Police, C. C. (2020). Youth sport concussion legislation: Nonstandard standards of care. *Sport and Recreation Law Association Conference*, 167-169.

CONFERENCE PRESENTATIONS

16. Brison, N. T., & **Murfree, J. R.** (2021, October). #TeamOcean: Examining athlete and pro-environmental nonprofit partnership activations on social media. [Submitted conference session]. Sport Marketing Association Conference, Las Vegas, NV.
15. Williams, D. P., **Murfree, J. R.**, & Hawley, J. (2021, April). *A content analysis of the Journal of Issues in Intercollegiate Athletics: 2008-2019* [Conference session]. College Sport Research Institute Virtual Conference, Columbia, SC.

14. **Murfree, J. R.**, Williams, D. P., & Orr, M. J. (2021, February). *Plastic rules! Legislative modernization of plastic use in sport for an increasingly sustainable, hygienic world* [Conference session]. Sport and Recreation Law Association Virtual Conference, Atlanta, GA.
13. **Murfree, J. R.** (2021, February). *Major League Baseball fans and climate change in the US: An ecological look at team identification, and environmental studies in sport*. [Conference session]. Commission on Sport Management Accreditation Virtual Conference, Houston, TX.
12. **Murfree, J. R.**, & McCullough, B. P. (2020, November). *Environmental justice: Sport, recreation, physical activity, and health* [Conference session]. Sport Management Association of Australia and New Zealand Conference, Virtual SMAANZ Week 2020, Canberra, ACT, AUS.
11. McCullough, B. P., & **Murfree, J. R.** (2020, November). *The game of environmental justice: Interplays of society and sport* [Conference session]. North American Society for the Sociology of Sport Virtual Conference, New Orleans, LA.
10. **Murfree, J. R.**, & Moorman, A. M. (2020, May). *An examination and analysis of Division I football game contracts: Legal implications of game cancellations due to extreme weather events* [Conference session]. North American Society for Sport Management Conference, San Diego, CA.
9. **Murfree, J. R.**, Police, C. C., & Shreffler, M. B. (2020, May). *Impostor phenomenon and the increased work demands on sport management faculty* [Conference session]. North American Society for Sport Management Conference, San Diego, CA.
8. Swim, N. M., **Murfree, J. R.**, & Police, C. C. (2020, March). *Youth sport concussions: Nonstandard standards of care* [Conference session]. Sport and Recreation Law Association Conference, Louisville, KY.
7. **Murfree, J. R.**, & Police, C. C. (2019, November). *Adidas x Parley: An exploration of corporate social responsibility* [Conference session]. North American Society for the Sociology of Sport Conference, Virginia Beach, VA.
6. Burpo, B. M., **Murfree, J. R.**, & Greenwell, T. C. (2019, April). *For the culture: An analysis of attraction, identification, and retention of HBCU classic consumers* [Conference session]. College Sport Research Institute Conference, Columbia, SC.
5. **Murfree, J. R.**, & Moorman A. M. [Advisor]. (2019, March). *College football game cancellations due to hurricanes: A bridge over troubled waters* [Conference session]. Sport and Recreation Law Association Conference, Philadelphia, PA.
4. Hums, M. A., & **Murfree, J. R.** (2019, March). *DACA, DREAMers, and citizen children of undocumented families: Information for high school coaches and administrators*

working at intersection of sport and immigration [Conference session]. Sport and Recreation Law Association Conference, Philadelphia, PA.

3. Williams, D. P., & **Murfree, J. R.** (2018, March). *Active versus passive ownership: An assessment of the passive activity loss and net investment income tax on minority team owners* [Poster session]. Sport and Recreation Law Association Conference, San Antonio, TX.
2. Williams, D. P., **Murfree, J. R.**, Tutka, P., & Rode, C. (2018, March). *The influence university athletics have on exposing out-of-state students to archaic state laws: A case study* [Conference session]. Sport and Recreation Law Association Conference, San Antonio, TX.
1. **Murfree, J. R.**, & Williams, D. P. [Advisor]. (2017, April). *An exploration into the transferability of social capital amongst college students between varsity sports*. [Poster session]. College Sport Research Institute Conference, Columbia, SC

MEDIA & IMPACT

4. Winter, D., James, I., **Murfree, J. R.**, Tholstrup, L., & Seymour, R. (2021, April 22). Impact analysis: How climate change is impacting sports [Panel session]. Sport Ecology Group Earth Day Series in partnership with BASIS (Virtual).
3. GreenSportsBlog. (2020, December, 16). Environmental justice, racial justice and sports: Ideas on the way forward. *Green Sports Blog*. <https://greensportsblog.com/environmental-justice-racial-justice-and-sports-ideas-on-the-way-forward/>
2. Orr, M. J. (Editor). (2020, August 17). Students in sport ecology, and the Sport Ecology Group's Graduate Student Mentorship Initiative [Audio podcast]. *Climate Champions*. <https://sustainabilityreport.com/2020/04/21/how-to-build-deeper-fan-relationships-through-sustainability/>
1. **Murfree, J. R.**, Swim, N. M., & Police, C. P. (2020, May 8). Youth sport concussions: Nonstandard standards of care. *Sports Litigation Alert*, 17(9). <http://www.sportslitigationalert.com/>

Note: Reprinted (2020, July 3). In *Concussion Litigation Reporter*. <https://concussionpolicyandthelaw.com/concussion-litigation-reporter/>

Note: Reprinted (2020, July 3). In *Sports Law Expert* [Blog post]. <https://sportslawexpert.com/2020/07/03/louisville-sport-administration-doctoral-students-write-about-youth-sport-concussion-legislation/>

RESEARCH GRANTS

3. **Murfree, J. R.** (PI), Moorman, A. M. (Co-PI), Casper, J. M., Stokowski, S. (2020). *An examination of public health and climate change factors in ACC game contract negotiations and cancellations*. Atlantic Coast Conference Innovation Initiative Research Grant Program. Requested \$5,925 – Program Finalist, Unfunded research grant.
2. Casper, J. M. (PI), Bunds, K., Smith, D., & **Murfree, J. R.** (2020). *Priorities and action regarding social justice: An investigation of ACC student-athletes, coaches, and administrators*. Atlantic Coast Conference Innovation Initiative Research Grant Program. Requested \$4,400 – Program Finalist, Unfunded research grant.
1. **Murfree, J. R.** (2020). *Major League Baseball v. climate change: A battle for the United States of America*. Agency: Commission on Sport Management Accreditation. Total \$1,750. **[Inaugural recipient]**

TRAVEL GRANTS

7. **Murfree, J. R.** (2019). *Graduate Student Council travel grant*. University of Louisville. \$200.
6. **Murfree, J. R.** (2018). *Graduate Student Council travel grant*. University of Louisville. \$200.
5. **Murfree, J. R.** (2018). *Mary Myers Travel Scholarship*. Sport and Recreation Law Association. \$500
4. **Murfree, J. R.** (2018). *Kinesiology graduate student travel grant*. University of Alabama – College of Education. \$250.
3. **Murfree, J. R.** (2018). *Graduate student travel grant*. University of Alabama – Office of Graduate Studies. \$250.
2. **Murfree, J. R.** (2017). *Kinesiology graduate student travel grant*. University of Alabama – College of Education. \$250.
1. **Murfree, J. R.** (2017). *Graduate student travel grant*. University of Alabama – Office of Graduate Studies. \$250.

EDITORIAL DUTIES

Frontiers in Sports Management and Marketing (Review Editor, 2020 – Present)

JOURNAL REVIEWER DUTIES

Ad Hoc Reviewer

Sport, Education and Society

TEACHING ACTIVITY AND COURSES TAUGHT

University of Louisville

SPAD 605: Graduate Sport Facility Management (Online)
SPAD 561: Sport & the Environment (Undergraduate & Graduate; Hybrid)
SPAD 405: Sport Facility Management (In-Person, Hybrid, & Online)
SPAD 402: Internships in Sport (In-Person & Online)
SPAD 401: Career Development in Sport
SPAD 281: Principles of Sport Administration (Hybrid & Online)
HSS 114: Fitness Walking

PROFESSIONAL EXPERIENCE

August 2020 – Present: *Clinical Instructor*, Department of Health & Sport Sciences, Sport Administration, University of Louisville.

August 2018 – July 2020: *University Diversity Fellow - Graduate Research and Teaching Assistant*, Sport Administration, University of Louisville.

August 2016 – May 2018: *Graduate Assistant – Event Management*, University of Alabama Athletics.

May 2015 – May 2016: *Event Management and Operations Assistant*, University of North Carolina Athletics.

January 2012 – May 2015: *Marketing Intern and Men's Soccer Manager*, University of North Carolina Athletics.

May 2014 – August 2014: *Summer Sports Promotions Intern*, SOCCER.COM – Hillsborough, NC.

PROFESSIONAL AFFILIATIONS

Sport Ecology Group, Affiliate Member, 2020 – Present.
North American Society for the Sociology of Sport, 2019 – Present.
North American Society of Sport Management, 2019 – Present.
Sport Ecology Group Graduate Student Mentorship Initiative, 2019 – Present.
Sport and Recreation Law Association, 2018 – Present.
Collegiate Athletic Operations Services, 2018 – Present.

FELLOWSHIPS, HONORS, AND AWARDS

Green Sports Alliance Summit Scholarship Recipient – Phase 3 Sports, 2020.
University Faculty Favorite Nominee, Delphi Center for Teaching and Learning – University of Louisville, 2019 – 2020.

Sport and Recreation Law Association President's Award for Outstanding Service, 2020.
 Chi Sigma Mu Honor Society Inductee – COSMA, 2020.
 Certificate of Training, Delphi Center for Teaching and Learning Principles of Online Course Design – University of Louisville, 2019.
 Women Leaders in College Sport Scholarship Recipient, 2018.
 Football Faculty Guest Coach, University of Louisville Athletics, 2018.
 University Diversity Fellow – University of Louisville, 2018 – 2020.
 Collegiate Athletics Operations Services Scholarship Recipient, 2018.
 Women Leaders in College Sport Scholarship Recipient, 2017.
 NCAA Emerging Leaders Scholarship Recipient, 2016.

SERVICE

Professional

North American Society for Sport Management

- Student Member, NASSM Sustainability Committee, 2020-2021.
- Member, NASSM Student Board, 2020-2021.

Commission on Sport Management Accreditation

- Board of Directors, Chair, 2021 – Present.
- Board of Directors, Vice Chair, 2020 – 2021.
- Board of Directors, Student Member, 2019 – Present.

Sport and Recreation Law Association

- Board of Directors, Student Representative, 2019 – 2020.
- 2020 Annual Conference Local Organizing Committee Member, 2019 – 2020.

University

University of Louisville

- Department (Health and Sport Sciences)
 - Student Engagement Committee, 2018 – Present.
 - International Service-Learning Trip Student Leader, 2018 – 2019.
- Program (Sport Administration)
 - Sport Administration Search Committee (Tenure-track Assistant Professor), 2019.
 - Sport Administration Search Committee (Open Rank Professor), 2019.
 - Sport Administration Master's Program Admission Interviews, 2019 – 2020.
- Student Organizations
 - Faculty Advisor, Sport Administration Association, 2020 – Present.
 - Founding Member, Sport Analytics Group, 2020 – Present.

Volunteer

July 2019: *Event Volunteer and Course Marshall*, NatWest International Island Games – Gibraltar, United Kingdom.

April 2019: *Green Team Member*, NFL Draft – Nashville, TN.

April 2019: *Green Team Member*, NCAA Final Four – Minneapolis, MN.

November 2018: *Research Team Member*, The Breeder's Cup – Louisville, KY.

December 2017: *Hospitality Liaison and Fan Ambassador*, Chick-fil-A Peach Bowl – Atlanta, GA.

April 2017: *Event Management Representative*, espnW Campus Conversations – Tuscaloosa, AL.